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ABSTRACT

The learning potential (LP) procedure represents an alternative method of measuring ability of Spanish-speaking students who tend to score low on traditional IQ tests. This study sought to determine the relative predictive power of LP and IQ measures on achievement of 188 first through sixth grade Spanish-speaking students. Subjects participated in the Raven and Series LP procedures and were administered the WISC Performance Scale in Spanish and the WISC vocabulary subtest, Picture Motivator Scale, and IAGAS numeric, nonverbal, and verbal subtests in Spanish and English. Numeric and nonverbal achievement in both Spanish and English were significantly related to posttraining Series LP scores, WISC performance IQ, and age. WISC vocabulary scores were related only to verbal achievement in the same language. The LP procedure resulted in increased levels of performance on a reasoning task and provided a better predictor of achievement than verbal IQ for these students. Included in the appendices are the instruments used in the study. (Author/DEP)

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APPLICABILITY OF LEARNING POTENTIAL MEASUREMENT WITH SPANISH-SPEAKING YOUTH AS AN ALTERNATIVE TO IQ

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CONTENTS

Page

Acknowledgements
Abstract
Introduction 1
Method 10
    Subjects 10
    Instruments employed in the study 11
        WISC 11
        Raven LP 11
        Series LP 12
        Picture Motivator Scale 13
        Inter-American General Abilities Series . . 14
Results 15
    Performance on ability measures 15
        WISC 15
        Raven LP 16
        Series LP 17
        Picture Motivator Scale 18
        Inter-American General Abilities Series . . 18
    Prediction of achievement by LP and IQ measures . 19
    Parents' attitudes toward language learning . . . 20
Discussion 21
References 25
Appendices
    A. Parent Questionnaire
    B. Raven Learning Potential Training Manual in Spanish and English, and student workbook.
    C. Series Learning Potential Tests and Training Manual and Materials
    D. Picture Motivator Scale

LIST OF TABLES

Page

1. Pretest and Posttest Means on Two Learning Potential Measures 18
2. Mean Scores on the Inter-American General Abilities Series 19
3. Average Achievement Scores for Inter-American General Abilities Series--U.S. Sample 19
4. T-tests of Independent Variables in Multiple Regressions 20

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LEARNING POTENTIAL MEASUREMENT WITH SPANISH-SPEAKING YOUTH AS AN ALTERNATIVE TO IQ TESTS: A FIRST REPORT

Abstract

The learning potential procedure represents an alternative method of measuring ability of Spanish-speaking students who tend to score low on traditional IQ tests. This study sought to determine the relative predictive power of LP and IQ measures on achievement of 188 first through sixth grade Spanish-speaking students. Subjects participated in the Raven and Series LP procedures and were administered the WISC Performance Scale in Spanish and the WISC vocabulary subtest, Picture Motivator Scale, and IAGAS numeric, nonverbal, and verbal subtests in Spanish and English. Numeric and nonverbal achievement in both Spanish and English were significantly related to posttraining Series LP scores, WISC performance IQ, and age. WISC vocabulary scores were related only to verbal achievement in the same language. The LP procedure resulted in increased levels of performance on a reasoning task and provided a better predictor of achievement than verbal IQ for these students.

LEARNING POTENTIAL MEASUREMENT WITH SPANISH-SPEAKING YOUTH AS AN ALTERNATIVE TO IQ TESTS: A FIRST REPORT

Alex Gimon, Milton Budoff, and Louise Corman
Research Institute for Educational Problems

Children from poor and/or nonwhite homes tend to score at below average levels, often in the mentally retarded ranges, on IQ tests which purport to measure intelligence. For the child who speaks a language other than English, this practice has resulted in a high incidence of children misclassified as mentally retarded and placed in special classes. Poor Spanish-speaking Americans of Puerto Rican, Mexican, or other Latin American origin have been over-represented in special classes for the mentally retarded, and are inappropriately educated as if they were mentally retarded. What casts greatest doubt on the validity of the low IQ score as a measure of these children's intelligence, more broadly defined, is that their behavior at home and in their community is generally perceived as adequate (Mercer, 1973). The President's Committee on Mental Retardation recently called attention to these children as "six hour retarded" children, i.e., retarded during the school day but not in their functioning in their home or community (President's Committee on Mental Retardation, 1969).

The designation of these children as mentally retarded by an IQ score is clearly inappropriate because they are culturally and linguistically different from the white, middle class, English-speaking students for whom the expectations of school programs are congruent with their prior and continuing home experiences. The poor and/or non-English-speaking child does not have the school-appropriate matrix of prior and continuing experience. The prediction of their intelligence as reflected in the IQ score is based on items inappropriate for these children. But the IQ score does correctly predict their failure in school, unless the program of the school is adjusted to their learning strengths.

Zirkel (1972) and DeAvila & Havassy (1972) have reviewed the relevant literature and demonstrated the inadequacy of existing procedures for testing Spanish-speaking children. Circumstances which may account for the usual finding of low IQ scores with Spanish-speaking children are:

1. They may lack competence in the vocabulary and the idiom of the English language.

2. The Spanish-speaking children of concern come from low income family backgrounds.

McCandless (1952) has described the cognitive consequences for the child from low income backgrounds:

"The environment from which the lower class youth comes is one providing minimal opportunity for the learning of the skills which are subsumed under the term intelligence. . . [rather it] is one in which he has maximum opportunity to learn "self-defeating" techniques--e.g., loosely defined expectancies of failure, absolute as opposed to relative thinking, concrete as opposed to abstract thinking, belief in his essential worthlessness, etc."

3. Existing IQ tests for Spanish-speaking children, even when translated into Spanish, can be criticized because the Spanish is assumed to be uniformly appropriate to Spanish-speaking youngsters. Regional dialects abound and direct translations may result in questions and vocabulary irrelevant to the Spanish-speaking child's experience (DeAvila & Havassy, 1972). The same word may have a different meaning for children from Mexican and Puerto Rican backgrounds.

4. The problem-solving orientation of the child is as critical as the manifest contents of the test problems, yet "culture fair" testing has ignored this problem. One reason for the failure to develop culture fair tests of intelligence may be due to the systematic manner in which the required latent problem-solving orientations have been ignored. Cattell (1940) and Eells, Davis, Havighurst, Herrick, & Tyler (1951) simply assumed that changing the contents of the problems or making them nonverbal, would remove the cultural bias of the test. Yet, Machover, Nissim, and Kinder (1935) long ago reported

that nonverbal tasks were inappropriate for West African children. Though "performance" items do not require verbalization in English, they do presuppose certain problem-solving orientations by which the information received is processed and the correct choice selected. Cattell's and Davis and Eell's tests failed to eliminate social class differences in attainments because middle class children are good abstract problem solvers regardless of the test contents.

Tests which consider cultural background should take account of the fact that the Spanish-speaking child is reluctant to guess when he doesn't know the answer to a question (Brussel, 1968; Hertzig, Birch, Thomas, & Mendez, 1968); that the Indian child is taught in the spirit of cooperation rather than competition and is reluctant to compete with his peers; that black, Spanish-speaking, and Indian children have little experience in spontaneously developing test-taking strategies which would enhance their performance on urban, middle class types of puzzles; that test items with time limits may run counter to the concept of time appropriate within a particular culture; and that there are a significant number of children from all of these groups who view the schools (and testing) as threatening, hostile, and alien.

To cope with these difficulties it has been suggested (Society for the Psychological Study of Social Issues, Fishman, Work Group Chairman, 1964; Mercer, 1972) that the norms of the intelligence test be adjusted to coincide with the average (and lower) performance of the Spanish-speaking reference group. However, DeAvila (1972) & Havassy have argued that adjusted ethnic norms, which reflect a lower standard of adequacy than the standard expected by our society, may provide justification for the self-fulfilling prophecy generated by teachers' low expectation of these children. This effect would perpetuate the achievement differences between poor and/or nonwhite, non-English-speaking children and their middle-class agemates, rather than provide means by which to narrow the gap between them.

Budoff (1969) has set forth the rationale for an alternate method to the IQ test for measuring intelligence, where this construct is defined as the ability to learn and profit from appropriate experience. Learning potential assessment utilizes a three-stage procedure which includes a pretest, a training session, and a posttest. The tasks employed to date have been nonverbal reasoning problems. The strategy is based on the premise that low income and/or minority group children differ in familiarity and experience with particular tasks, have a negative expectancy of success in test-taking, and are less effective in spontaneously developing strategies appropriate to solving the often strange problems on a test. Training helps these children develop a sense of competence on the task by providing them with problem-relevant strategies in a context of positive support. Two scores are derived from the learning potential assessment paradigm. Pretraining scores reflect the present functioning ability of the child on the task. The posttest scores reflect what the children can do following the training experience which seeks to equalize the test-taking disadvantages of the poor, and/or nonwhite, and/or non-English-speaking child.

Considerable work has been completed with this measurement approach. Children and adolescents who were IQ-defined as educable mentally retarded and placed in special classes for the retarded, were more competent by the yardstick of the learning potential assessment procedure than the low IQ score, which served as the primary placement criterion, would indicate. Up to two-thirds of these low income, low IQ, white and black children scored in dull and average ranges on the nonverbal reasoning tasks following training.

Like IQ scores, pretraining learning potential scores have been shown to correlate positively with socioeconomic indicators of disadvantage such as intactness of family, noninstitutionalization, English language competence, Stanford-Binet, and verbal and performance scale IQs (Budoff & Corman, 1974). Scores on the posttraining administration indicate the power of a training-based assessment procedure model with institutionalized and community special class children with IQs in the mentally retarded range. Greater than expected effects of training were demonstrated by children from large families, born outside the Northeast (largely Southern-born blacks), and foreign-born children. In contrast to pretest scores, the bias in performance against the institutionalized child was not evident. The relationship to Stanford-Binet scores was found to be low and nonsignificant, and Wechsler verbal IQs were unrelated to posttraining performance. Posttraining scores continued to be related to performance IQ measures, e.g., Wechsler Performance IQ. The patterns of "disadvantage" most clearly evident in the relationships of the demographic variables to Stanford-Binet, and WISC IQ, and pretraining scores were not evident with posttraining scores (Budoff & Corman, 1974).

These children clearly have severe educational problems which are predictable from their low academic aptitude (IQ) scores, but the heightened score following task-appropriate training on a nonverbal reasoning task clearly indicates ability to profit from experience that might be available for more satisfactory school learning if child-appropriate educational units were given the child. Budoff, Meskin, and Harrison (1971) demonstrated that response to learning potential training, not IQ score (or special versus regular class placement), differentiated students' performance on an electricity unit that emphasized empirical learning. Some low IQ children can learn and apply principles when the modes of learning and response are child-appropriate.

For low income children, the problem of the cognitive match (Hunt, 1961) is critical.

Studies of average IQ black and white children, differing in socioeconomic status, have demonstrated the reduction of social class differences following learning potential training, when two different measures of learning potential (LP) were used (Budoff & Corman, in press; Budoff & Corman, 1973). Although mean posttraining scores of middle class children were higher following training, large proportions of low income children, regardless of race, performed at the mean pretest level of their middle class peers following training. It may be that additional attention to methods of improving the low SES child's understanding of the reasoning problems, e.g., by training over a more extended period, might narrow the social class gap even further. Training-based assessment procedures such as learning potential may permit "culture fair" assessment of children's ability regardless of ethnic, social class, or racial background.

The purpose of this study was to compare the relative predictive power of LP and IQ measures with Spanish-speaking students. The criterion measure was the Inter-American General Abilities Series (IAGAS), the only achievement test with comparable forms which measure competence in Spanish and English. The learning potential predictors were posttraining scores on the Raven's Matrices and Series Learning Potential measures administered with Spanish language instructions. The IQ predictors were WISC performance scale, administered in Spanish, and scores on the WISC vocabulary subtests, administered individually in Spanish and English. These subtests provided an estimate of verbal IQ in both languages. Albizu, Stanton, and Matlin (1966) reported that the prorated vocabulary score provided the best estimate of verbal IQ for Puerto Rican persons. Since motivation can influence test performance, the Picture Choice Motivator Scale (Haywood, 1968) was administered in Spanish and English and was also included as a predictor.

Hausman (1972) explored the predictive validity of IQ scores (Primary Mental Abilities and WISC) and LP measures (Raven's and Kohs' Learning Potential) with bilingual Mexican American students. He reported that Picture Motivator and Raven's LP scores were significant predictors of arithmetic achievement on tests administered in Spanish. In the present study it was hypothesized that the two posttraining LP scores would be better predictors of achievement for this low income sample than either the English or Spanish verbal IQ measures. Since LP scores have been shown to be highly related to performance IQ (Budoff & Corman, 1974), little difference between the predictive power of LP and performance IQ scores was expected.

Method

Subjects

One hundred and eighty eight Spanish-speaking students from two urban school districts in Massachusetts were tested. The 78 girls and 110 boys ranged in age from 6-2 to 14-10 with a mean of 10-3 (± 2-2) years. Seventy six were in grades 1 to 3 (mean CA = 8.67 ±1.50 years) and 112 in grades 4 to 6 (mean CA = 11.75 ±1.25 years). The students in both schools were similar in age and IQ, and spoke Spanish primarily. However, one school program used Spanish as the primary language of instruction with English as a second language (transitional bilingual model), while the other school taught the students academic subjects in English.

Descriptive information on the family backgrounds of students in the sample was obtained through a questionnaire to parents which was sent home with the child. Telephone or personal contact was established by a Spanish-speaking community resident in order to obtain the necessary information when the questionnaire was not returned. Questionnaires were obtained for 72 (37%) of the students.

Responses to the questionnaire revealed that 92% of the students were either born in Puerto Rico or their families had migrated from that island. Low socioeconomic status of the average respondent was indicated by the mean family size of 6.26 (±2.83) and the mean number of years of mother's education, which was 6.46 (±2.9). English and Spanish versions of the Parent Questionnaire are in Appendix A.

Instruments

WISC IQ. The Spanish translation of the performance subtest of the Wechsler Intelligence Scale for Children (Escala de Inteligencia Wechsler para Ninos, 1954, Puerto Rican version) was given to all students. The vocabulary subtest of the WISC was administered in Spanish and English with language order counterbalanced. Estimate of verbal IQ score was obtained by prorating these scores.

LP measures. The two learning potential measures were group administered with instructions for testing and training presented in Spanish. The order in which the two measures were administered was counterbalanced to control for carryover effects of training on one measure to performance on the other.

1. Raven Learning Potential Test. Sets A, AB, B of the Raven Progressive Matrices (1956) were group administered to all students on the day prior to and the day following a 45-minute training session. Intermediate grade students were also administered Sets C, D, E (1958) because of the test ceilings.

A training booklet which contained nontest problems dealing with pattern completion, orientation of elements within a pattern, and double classification problems was distributed to each child. The trainer presented the problems on 2 X 2 slides from a Kodak Carousel projector on a blackboard. The students were required to draw in the missing element for the design before they looked at the six choices presented on the lower half of the page. For the double classification problems, it was found that children could easily derive one attribute at a time, but often did not hold the first attribute in mind while they derived the second relevant attribute. During development of the training procedure, the child's understanding was facilitated by having him draw the relevant attributes, one at a time, as he derived them. This procedure helped concretize the elements of the solution process so that many children, after this type of practice, could do the double classification problems mentally with very little trouble. The requirements of each problem type were presented in meaningful designs initially, e.g., an American flag with a piece missing, and then a geometric form to attune the child to the basic format of the Matrices test problems. Individual children were called to indicate the correct choice, and to give reasons for their choice. A slide with the answer included allowed them to compare their choice and to correct it, if necessary. English and Spanish Raven training manual and workbook are in Appendix B.

2. Series Learning Potential Test. The Series Learning Potential Test is a nonverbal reasoning task in

which each item presents a horizontal series of pictures and a blank cell. Two comparable forms consisting of 65 items and including 40 pictorial series items, 10 geometric series, and 15 matrix items, are available for administration prior to and following training (Babad & Budoff, in press). The subjects must identify among the multiple choices the one which best completes the series. The concepts in a series of pictures vary systematically in type of figure, size (large/small), color (black/white), or orientation (up/down or either side). Thus, a blank cell may require a large, black puppy dog. The child is trained to identify each concept separately, trace its pattern in the series, and cross out the choices that are inappropriate for a correct solution. Sequentially, the child will be asked to choose a dimension. e.g., size, and a rhythmic "tune"--large, large, small; large, large, small; ________, large, small to identify the size of the missing figure. All the small figures among the answer choices would be eliminated. The child would do the same with each relevant dimension for the items. After the "tune" for each dimension is sung, incorrect choices are crossed out, until the single correct answer remains. Test books, training materials, and English and Spanish instructions for the Series Learning Potential Test are in Appendix C.

Picture Motivator Scale. The Picture Motivator Scale (Haywood, 1968) was group administered in both

Spanish and English with language order counterbalanced. This scale is a 20-item forced choice measure of a student's motivational orientation, either intrinsic or extrinsic. Twenty 2 X 2 slides project a pair of activities from which the student is to choose the one which he would most like to do. Each pair includes one activity which typifies an intrinsic behavior, while the other shows an extrinsically oriented behavior. Haywood (1968) indicated that high scoring "motivator-oriented" individuals respond to intrinsic, self-actualizing factors, e.g., a need for achievement responsibility in the successful performance of tasks. The low scoring "hygiene-oriented" individual is motivated by extrinsic environmental factors. He seeks his principal satisfactions in the ease and comfort of the environment, has strong seeds for security, and avoids effortful task participation. English and Spanish versions of the Picture Motivator Scale are in Appendix D.

The Inter-American General Abilities Series (IAGAS). This standardized multiple choice achievement test was administered in Spanish and English with language order counterbalanced. It is the only standardized achievement test available with comparable forms in Spanish and English. Levels 2 and 3 were used. Level 2, developed for use with second and third graders, consists of 100 items which measure oral vocabulary, numbers (oral and written), and nonverbal skills (classifications and analogies).

Level 3, developed for grades 4, 5, and 6, consists of 150 items in six parts: sentence completion, figure analogies, computation, number series, word relations, and figure classifications. Both levels of the test combine subtests to yield three subscores: verbal, numerical, and nonverbal scores.

Procedure

The measures were administered in the following order: WISC IQ (performance and vocabulary), Achievement, Picture Motivator, and learning potential. Standardized instructions for each instrument were used. Language order of administration of the Spanish and English vocabulary, achievement tests, and Picture Motivator Scale was counterbalanced with each pair of measures given on consecutive days. The learning potential measures were administered on three consecutive days--pretest, training, posttest, with order of the two measures counterbalanced. Both learning potential measures were not presented during the same week to any group of students.

Results

Performance on Ability Measures

WISC IQ. Scores on the Spanish WISC performance scale and the vocabulary subtests in English and Spanish portray these Spanish-speaking children as intellectually below average. Many children's scores would classify them as mentally retarded. The average WISC performance IQ for the primary and intermediate grade students was 86.28 (±14.82) and 85.71 (±13.34), respectively. The prorated WISC verbal IQs obtained from the vocabulary subtest scores for the younger and older students respectively were: Spanish: 76.25 (±16.15) and 77.47 (±18.34); English: 52.44 (±21.62) and 48.72 (±22.72). Analysis of variance indicated that Spanish vocabulary scores were significantly higher than English scores ($\underline{F} = 267.67$, 1/173 $\underline{df}$, $\underline{p} < .001$), with no significant effect due to order of administration.

The tests administered in English illustrate the subjects' minimal understanding of the meaning of the words in English (mean scaled score 2.12 ±2.67). Even when the words were administered in Spanish, the mean prorated verbal IQ score was in the borderline retarded range (mean scaled score = 6.47 ±5.45). The derived verbal IQ indicates the abysmally poor prognosis of these children given the traditional emphasis of school programming. This seems to be especially evident with English test scores, but even when the tests are presented in Spanish, the verbal skills evidenced by the average vocabulary score are poor.

Learning Potential. No systematic effect of order of administration of the two LP measures was found on either Raven posttraining score ($\underline{F} = 0.00$, 1/148 $\underline{df}$) or Series LP posttraining score ($\underline{F} = 0.63$, 1/143 $\underline{df}$). The mean pre and post scores of the students on the Raven

Progressive Matrices and their percentile ranking by their chronological age norms are presented in Table 1. After the students were taught the strategies for solving the problems presented in the Raven test, their scores increased significantly (*t* = 4.20, *df* = 73, *p* <.001 for primary students; *t* = 4.09, *df* = 110, *p* <.001 for intermediate students). Posttraining scores on the Raven placed these students at or above the average score for children of their chronological age although their pretraining scores averaged well below the mean. Thus, after 45 minutes of problem-appropriate training on a nonverbal reasoning task, these children were, on the average, able to markedly increase their scores relative to children their own age.

Posttraining scores on the Series Learning Potential measure (Table 1) also increased significantly (*t* = 3.32, *df* = 73, *p* <.01 for primary students; *t* = 2.56, *df* = 110, *p* <.05 for intermediate students). One difficulty with the Series Test is that children older than 9 years of age tend to attain a de facto ceiling, which accounts for the lower average gain displayed by the intermediate grade students. The ability to profit from the training on both reasoning tasks and apply these skills to untrained problems casts strong doubt on the validity of the low WISC IQs and the conclusions that these students have limited ability to profit from suitable educational experiences.

Insert Table 1 about here

Picture Motivator Scale. Means on this test were 10.11 (±2.96) in English and 9.76 (±2.93) in Spanish. Analysis of variance revealed no significant effects due to language or order of language presentation. There was a significant difference between students in the two towns ($F = 6.875$, $df = 1/126$, $p < .01$). Students in one town were more intrinsically oriented than students in the other (mean = 10.5, SD = 3.0 for Town W; mean = 9.3, SD = 2.9 for Town L). This finding may indicate that the bilingual program of Town W, conducted largely in the child's native language, is more intrinsically motivating than a program which stresses attainment of English language competence. The scores on the English or Spanish versions of the Picture Motivator Scale were not significantly correlated with IQ or learning potential scores.

Achievement test (IAGAS). Analysis of variance revealed no significant differences between Spanish and English scores on the nonverbal or numerical subtests and no significant effect due to the language order in which the subtests were administered. Scores on the verbal subtests varied with language order and language of administration. Higher scores were attained on the Spanish verbal achievement test ($t = 4.15$, $df = 182$, $p < .001$). Mean scores on the IAGAS for primary and intermediate students are presented

TABLE 1

Pretest and Posttest Means on Two Learning Potential Measures

	Raven						Series	
	Sets A,AB,B			Sets A,B,C,D,E				
	$\bar{X}$	SD	Percentile[a]	$\bar{X}$	SD	Percentile[a]	$\bar{X}$	SD
Primary students								
Pretest	17.21	6.97	25	---	---	--	23.94	11.48
Posttest	22.12	7.36	67	---	---	--	30.81	13.36
Intermediate students								
Pretest	24.56	6.53	25	30.14	10.54	22	38.84	11.83
Posttest	27.12	6.35	50	35.40	8.62	43	43.16	10.66

[a] Percentiles are based on Raven's (1958) norms.

in Table 2 and national norms by grade level in Table 3. Although few students scored at or beyond their expected grade level even on the Spanish version, the considerable range of scores among the students indicated that some children were profiting more from their school experiences than others. A comparison of the average scores attained by these children with the scores for the Mexican American standardization sample indicates that these children were performing, on the average, well below their expected levels in Spanish and English.

Insert Tables 2 and 3 about here

Prediction of Achievement by LP and IQ Measures

To test the relative predictive power of LP and IQ measures, a stepwise multiple regression analysis was performed on each of the six IAGAS achievement measures (Spanish and English scores on the verbal, nonverbal, and numeric subtests). Independent variables in these equations were posttraining scores on the Raven and Series LP measures (R2 and S2), age, WISC performance IQ, Spanish and English WISC vocabulary scores, and Spanish and English Picture Motivator scores. The order of entry of independent variables in these equations was determined by the amount of variance accounted for by each variable. Results of these analyses are presented in Table 4.

TABLE 2

Mean Scores on the Inter-American General Abilities Series

Test	Average score	Standard deviation	Range of scores
Level 2 (Grades 1-3)			
Spanish verbal	17.919	5.73	0-30
English verbal	13.378	12.45	0-21
Spanish nonverbal	18.730	8.95	0-37
English nonverbal	19.865	6.76	1-34
Spanish numerical	12.703	7.02	2-28
English numerical	10.919	6.83	1-27
Level 3 (Grades 4-6)			
Spanish verbal	16.533	10.93	0-47
English verbal	11.911	6.08	2-35
Spanish nonverbal	27.600	10.63	3-47
English nonverbal	26.067	9.43	7-45
Spanish numerical	16.578	8.20	0-41
English numerical	18.400	8.87	0-37

*$p < .05$.

TABLE 3

Average Achievement Scores for Inter-American General Abilities Series--U.S. Sample

Level 2

	Verbal and numerical		Nonverbal	
	$\bar{X}$	SD	$\bar{X}$	SD
Grade 2	35	6.5	26	5.6
Grade 3	43	6.4	29	5.2

Level 3

	Verbal		Numerical		Nonverbal	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Grade 4	30	8.9	27	8.5	33	8.3
Grade 5	35	8.6	34	8.3	37	6.8
Grade 6	43	6.2	37	5.9	39	6.0

Insert Table 4 about here

The hypothesis that the LP measures would be better predictors of achievement than the verbal IQ measures was supported, particularly when the Series LP measure is considered. The best combination of predictors of nonverbal and numeric achievement in both Spanish and English was provided by the Series posttraining LP score, age, and WISC performance IQ. That is, students who were older or had a high posttraining score or performance IQ had the highest nonverbal and numeric achievement scores, regardless of whether achievement was measured in Spanish or English. The negative sign of the beta weight for the English Picture Motivator score indicated that more extrinsically motivated students also achieved higher scores on the English nonverbal (as well as verbal) subtests.

Raven posttraining scores, together with age, performance IQ, and Spanish WISC vocabulary scores, were significant predictors of verbal achievement in Spanish. High verbal achievement in English was related to age, high scores on the English WISC vocabulary test, and extrinsic motivation. The verbal IQ measure significantly predicted achievement only on the verbal subtest given in the same language in which the WISC was administered.

Parents' Attitudes Toward Language Learning

An effort was made to determine the parent's attitudes

TABLE 4

T-tests of Independent Variables in Multiple Regressions

Independent variables	Dependent variables					
	Verbal Spanish	Verbal English	Nonverbal Spanish	Nonverbal English	Numeric Spanish	Numeric English
Raven posttest	1.98*	.51	1.36	-.00	1.19	.63
Series posttst	-.05	1.22	2.58*	2.18*	3.04**	2.90**
Age	3.22**	2.11*	4.41***	6.04***	5.01***	5.04***
WISC perf.	2.79**	1.31	3.90***	5.81***	4.24***	3.64***
WISC voc.Span.	2.77**	1.54	1.08	1.12	.60	.98
WISC voc.Eng.	-1.20	2.37*	1.73	-.12	1.36	.81
Pict.Mot.Span.	.80	.48	-.78	1.09	1.40	.42
Pict.Mot.Eng.	-1.34	-2.38*	.19	-2.43*	-1.52	.73
r^2	.26	.18	.42	.44	.46	.43
F (df = 8/179)	7.94***	4.86***	16.21***	17.48***	18.84***	16.93***

*p <.05

**p <.01

***p <.001

toward their child learning Spanish or English. In one section of the parent questionnaire the respondent was asked whether he thought the following were good reasons for his child to learn Spanish: to make him a better Puerto Rican, to enable him to make more friends, to be better educated, to help him get a better job. The same questions were asked regarding reasons for learning English, with an additional reason: learning English would help the child to think like an American. Only 34 parents understood or were willing to answer this section of the questionnaire. Almost all respondents consistently indicated that they favored every reason for learning both Spanish and English. The only exception was the response of six parents who did not feel that learning English would make their child a better Puerto Rican. Parents' responses to these questions indicated their desire for their children to be bilingual, maintaining reading and writing skills in their native language as well as in English.

Discussion

Optimizing the manner in which measures of ability to profit from experience, i.e., intelligence, are administered does indicate promise of providing a culture-fair approach to measuring ability. The tests given in the traditional single administration format indicated the usual findings that these students tend to perform in the dull normal range on Spanish language versions of the WISC Performance Scale.

The pretraining administration of the Raven Progressive Matrices indicated a similar level of performance. When the vocabulary subtest is used as an estimate of verbal IQ, the scores also fell in the mentally retarded ranges. Clearly these students are not competent when their spontaneous productions on school-oriented language or problem solving tasks are used as the basis for the estimates of intelligence. But these estimates reflect the combined effects of their recent arrival from Puerto Rico, the difference in their language, and their low socioeconomic status. Low income students, regardless of linguistic or cultural background appear to share a broad range of difficulties when confronted with the middle class style of reasoning problems in tests, and presumably, in school.

By contrast, showing these low income Spanish-speaking students how to perform more effectively on a reasoning task, in a competence-inducing context, seems to result in higher absolute levels of performances on the reasoning task. As an indication, these students increased their scores from an average Raven pretraining score at the 25th percentile to average and above average levels following training. While the performance IQ and Raven's pretraining scores were at comparable levels, posttraining scores reflected markedly increased competence on the Raven task.

Further, posttraining learning potential scores were significantly related to the achievement scores in Spanish and English, as were the performance IQs, but the verbal IQ scores were only related to verbal achievement in the same language.

The achievement measure used in this study, however, is less valid than would be desirable for a criterion of the learning potential procedure. These students performed poorly in Spanish and English on the achievement tests. On the average their skills fell well below the norms for the Mexican American population on which the tests were standardized. It may be argued that the low IQ scores do clearly indicate that these students' academic aptitude scores are low and in essential agreement with the low achievements. They will (and do) fail to progress satisfactorily in the traditional academically-focused programs. From scores on this test, the inference is drawn that these students are less intelligent, i.e., they cannot perform more adequately.

One major response to this clearly discriminatory judgment has been to re-standardize the traditional IQ and achievement tests so they will normatively reflect the scores of low income and/or bilingual students (Mercer, 1972). But lowering the norms will only lower the expected level of performance which will be reflected in a lower level of educational stimulation and challenges accorded these children. The result will be a de facto outcome that they are less able because their educational attainments are low. In short, lowering the raw score norms will reduce the incidence of mislabeling as mentally retarded, but will fail to close the gap between the child's acquired competencies and the deficiencies perceived by the school, and by extension, the society.

A training-based assessment shows promise of providing a culture fair assessment of ability to profit from experience and meeting these objections. The criterion of adequate performance is maintained because the posttraining scores are evaluated in the context of the child's normative age group for the general population. But the recognition that low income and/or non-English-speaking children suffer considerable handicaps in responding to the test problems has resulted in a significant reorientation in the testing procedures. Training, i.e., helping the students to perform more effectively on the reasoning problems, enables the capable student to reorient his problem solving abilities to the demands of middle class biased procedures. Further, embedding the test within this competence-enhancing learning situation helps the child who expects to fail cope with the anxiety generated by the test situation.

To indicate the broader significance of this increased capability following training, better validity criteria are required that permit these children to demonstrate this general capability to reason without the negative effects of language-related learning that may hamper its expression. Specifically, the experimental paradigm must permit these children to learn concept-appropriate information and principles over time, unlike the achievement criterion which measures adequacy of past acquisition. Specially designed curricula that emphasize learning concepts experientially have served to demonstrate this broader capability with low income IQ-defined EMRs (Budoff, Meskin, & Harrison, 1971). This validity criterion can indicate the educational implications of the increased ability to reason following LP training as well.

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APPENDIX A

Parent Questionnaire

Cuestionario para Padres

Nombre ______________________________ Teléfono _____________

Dirección ____

¿Cuántas personas viven con usted (marquelo con un circulo)?

1 2 3 4 5 6 7 8 9 10

1. ¿Donde nació usted? __________________________________
2. ¿Donde nació su marido (esposa)? ________________________
3. ¿Donde estudió usted? _______________________

   ¿Cuántos años? ____________
4. ¿Cuántos años ha vivido en Boston? ___________________
5. ¿Donde vivió antes de moverse a Boston? _____________________
6. ¿Va usted a Puerto Rico para visitar a la familia? si ___ no ___

   ¿a los amigos? si ___ no ___

   Si contestó si, ¿cuantos veces? ____________________
7. ¿Ha vivido usted por un tiempo en los EE.UU., despues se mudó a Puerto Rico, y ahora esta viviendo en Boston? _________

   Si contestó si, ¿por cuanto tiempo se quedó en Puerto Rico?

   ____
8. ¿Piensa usted regresar definitivamente a Puerto Rico en el futuro? si ___ no____
9. ¿Que periódicos o revistas acostumbra usted comprar?

   ____
10. ¿Oye usted el radio en Español? si ___ no ___

    en Inglés? si ___ no ___

    ¿En que idioma prefiere usted oir el radio? ________________

11. ¿Tiene usted oportunidad de hablar Español cuando usted:

a) hace las compras? si ___ no ___

b) paga las cuentas de luz, gas, etc? si ___ no ___

c) viaja por tren or guagua? si ___ no ___

d) trabaja? si ___ no ___

12. ¿Cuántas veces va usted a la escuela para hablar con la maestra de sus niños?

una vez a la semana ______

dos veces al mes _______

una vez al mes ______

nunca ______

otro ______

13. ¿Antes de ir a la escuela, puede sus niños

a) decir el alfabeto en Español? si ___ no ___

en Inglés? si ___ no ___

b) reconocer las letras en Español? si ___ no ___

en Inglés? si ___ no ___

c) contar en Español? si ___ no ____

en Inglés? si ___ no ___

14. ¿Cuando usted habla con su marido (esposa) habla usted en Español o Inglés? ___________

con los niños? _________

con los amigos? __________

¿Es esta una razón buena para sus niños apprender Español?	muy buena razón	buena razón	mas o menos	mala razón	muy mala razón
Lo hace ser mas Puertorriqueño					
Pueden hacer mas amigos					
Lo hace ser mas educado					
Lo ayuda conseguir trabajo					

¿Es esta una razón buena para sus niños apprender Inglés?					
Pueden hacer mas amigos					
Podrían pensar como Americanos					
Lo hacer ser mas Puertorriqueño					
Lo hacer ser mas educado					
Lo ayuda conseguir trabajo					

APPENDIX B

Raven Learning Potential Training Manual, English

Raven Learning Potential Training Manual, Spanish

Student Workbook

Please note that the Spanish version of the Raven training instructions were geared to individual administration and therefore do not match the training workbook here attached.

MANUAL OF INSTRUCTIONS FOR TRAINING ON TYPES OF PROBLEMS WHICH APPEAR IN RAVEN PROGRESSIVE MATRICES

This manual presents training procedures oriented toward increasing the understanding of problems which appear on Raven Progressive Matrices. This learning potential assessment procedure involves an individual or small group administration of the Raven Matrices. For students 11 years of age and younger, Sets A, A_B, B (1958) are administered. For students over 11 years of age, immediately after students complete Sets A, A_B, B, Sets C, D, E (1956) are also administered.

Following this pretest, the training procedures in this manual are implemented. This manual provides training procedures for small groups which can generally be completed in one day, although the trainer (T) must critically attend to whether the children are fatigued. Training is oriented toward helping the children understand what they must do in order to solve the Raven Progressive Matrices problems. If the procedure becomes too fatiguing for the group, a break is recommended, with resumption the next day.

After the training session is completed, the Raven Matrices test is readministered in a group within three days. Both pre- and posttraining administrations use redesigned Raven answer sheets in which answers to Sets A, A_B, B and C, D, E are recorded on separate sheets. The spaces for the three scales are larger on the redesigned answer sheet so that the children will be less confused.

In administering the Raven test, the procedure described below, largely drawn from the Raven Manual, is followed.

DIRECTIONS FOR ADMINISTRATION OF RAVEN MATRICES

Before pupils enter, draw on the blackboard a sample of the answer sheet form.

After pupils are seated distribute pencils and answer sheets. The Instructor says, "On the table in front of you, you will find an answer sheet. Please write your name, both first and last names, at the top of the page." Red booklets (Sets A, A_B, B) are then distributed and pupils told not to open the books until everyone is ready.

The instructor then says, "Open your books to the first page with the green puzzle. It is like this (shows his book). At the top of the page it says Set A and you have a column A here on your answer sheet (points to sample on blackboard). This is problem A.1. You see what it is. The upper part is a puzzle with a piece missing. Each of these pieces below (instructor points to each in his book) is the right shape to fit the space, but they do not complete the pattern. Number 1 (he points to the piece and then to the pattern) is the right shape but the wrong pattern. Numbers 2 and 3 are wrong--they fit the space, but they are not the right pattern. What about number 6? It is the right pattern (instructor illustrates that the pattern is the same as the pattern above) but it does not go all over (he points to the white piece). Put your finger on the one that is completely right. Yes, number 4 is the right one. So the answer to A.1 is 4. Write 4 here (points to answer sheet on blackboard), beside number 1 in Column A on your scoring form. "Do not turn the page over yet." "Are there any questions?"

"On every page in your book there is a puzzle with a piece missing. You have to decide each time which of the pieces below is the right one to complete the puzzle. When you have found the right piece, write its number on your answer sheet beside the number of the pattern. They are simple at the beginning and get harder as you go on. There is no catch. If you pay attention to the way the easy ones go, you will find the later ones 'not as hard.'"

"Let's try another one together. Turn to the orange page to A2. Look at the big pattern at the top of the page to find the piece that is missing. Now, look carefully at all the six pieces below. Remember only one is totally correct. Pick the one which you think is completely right and write its number beside 2 under Column A on your answer sheet. . . (When everyone has it). The right one is number 5. See that you have written the figure 5 against number 2 in Column A on your form. Are there any questions?"

"Now you can finish column A by yourself. Make sure you do twelve (12) puzzles--don't skip any pages. When you finish Column A, go back and check your answers. When you're sure they're all correct, stop and raise your hand. Work at your own pace. You can have all the time you want. Do not leave any out. Work slowly and look carefully at all the pieces below the puzzle pattern before you choose one. See how many you can get right."

(When each child raises his hand at the end of set A, the instructor should go to the child and check to see that the answers have been recorded in the correct spaces on the answer sheet. The following instructions are then given individually to each child.)

"Turn to the page where it says Set A_B on the top, problem number 1. The answer to number 1 goes up here in the second column. Now continue doing the puzzles in Set A_B. Do all 12 problems and make sure you put your answers in the second column next to the numbers of the puzzles. When you finish this column, raise your hand.

(Repeat above procedure for Set B).

During the administration of the test there is no time limit. When a child completes each set he is reminded that he can check his answers before he raises his hand. When the children are finished, they are instructed to insert their answer sheets inside their booklets and to close their booklets. When most of the children have completed the test, the booklets can be collected from those who have finished, and the children should quietly take out some other work. Children who are really working very slowly should be encouraged to try to finish. Usually 30 minutes is adequate time to do all the problems in the red book.

Instructor must circulate constantly to check that each student is working at the correct place on the answer sheet. If child is not on the right item, place a mark at that point on the answer sheet and redirect the student to the line which agrees with the problem he is working. At some point, review each problem with student individually to be certain that the answers he entered on each line are those he intended. This may be done during the testing period while waiting for all the students to complete their work, or more usually, at the end of the period. This is a most important part of the procedure since student's understanding can only be gauged by the answers he records. Instructor must circulate constantly to be certain student is writing the answers on the correct line on his answer sheet which corresponds to the problem in the test booklet.

When students have completed Set B, are 11 years old or older; they are to continue with Sets C, D, E. Collect red test booklets and completed answer sheets and pass out tan booklets (1956) which contain Sets C, D, E. A useful maneuver to minimize confusion is to distribute the booklets containing Sets C, D, E with the answer sheet interleaved at problem C1. Students are asked to write their names, school, and the date on the answer sheet and then are asked to close the test booklet with the answer sheet left in at C1, and wait until everyone is ready. Students are instructed not to open the books until everyone is ready.

Since the tan books (Sets C, D, E) are only given to children eleven years or older, it would be best to schedule separate testing sessions for the older and younger children if a class has mixed age groups.

Instructor: "Open the booklet to where it says Set C." (Check that all students have skipped Sets A and B and are in the right place.) "You can see that this is just like what you've been doing except that there are eight pieces below instead of six. Let's look at C1. You see if you start up here (top left and go down column), this one, is to this one, is to this one, as (move finger to second column) this one, is to this one, is to this one, as (third column) this one, is to this one, is to which one? (Point to each of eight pieces in turn.) Yes, number 8 is right. Beside the number in column C on your answer sheet, write the number 8. Now you can continue through Set C. Find the missing piece in the big pattern above. Be sure to look at all the eight pieces below and choose carefully the one that is exactly right. Write its number on the answer sheet beside the number of the pattern. Work slowly and carefully. Make sure you turn only one page at a time. Make sure you do all 12 puzzles in Column C. Notice there are puzzles on both sides of every page, so make sure you look at the backs of the pages. See how many you can get right. These are more difficult so don't get discouraged. Do the best you can. You are not expected to get all of them right. When you have finished Column C, check your answers and then raise your hand." Children should be individually instructed to turn to Set D after the instructor checks that the answers are in the correct spaces. For high school aged students, these pauses between sets may be omitted and the students instructed to complete the book. The red books with the colored Progressive Matrices are always collected before the tan books containing Sets C, D, and E are distributed. The children should be cautioned to make sure the numbers for the answers are always put on the line which corresponds with the number of the puzzle they are working on.

Encourage students to do their best and indicate that they may skip problems they don't understand, or can guess at the correct answer as there is no penalty for guessing.

For re-administration following training: Instructor: "You may remember these puzzles. You worked with them before and today you are going to have another chance to show how well you can figure them out." Administer as indicated for the pretest. Cue children before posttest: "Remember the tricks you learned yesterday. What happens in the first row happens in the second. Remember what changes and what stays the same."

TRAINING PROCEDURE

Objectives: The training procedure is designed to teach the children the following:

1. Attend to all the choices presented in each problem.
2. To think about the problem reflectively rather than impulsively choosing an answer.
3. Within a micro teaching situation, to solve problems involving two-dimensional stimuli.

Since successful performance on the posttesting requires that the child have the above skills, this training procedure should be adhered to closely. In some instances, the instructor may encounter some children having difficulties. In this case, it is recommended that the instructor use other examples which he or she may think of to help the child.

The training procedure helps children deal more effectively with four types of problems: discrete pattern completions, continuity and reconstruction of simple and complex structures, reasoning by analogy in a 2 x 2 format, and easy linoleum block completions. The procedures allow several alternative approaches to pe presented to S to make sure that he understands the requirements of the problem.

Throughout the training period, a number of principles are adhered to.

1. No problem which appears in Raven's Progressive Matrices is presented in the training series so that there is no item specific training.

2. Great efforts are made to be certain that the children understand the demands being made of them on the task.

3. The requirements of the task are demonstrated initially on materials that are pictorial and meaningful, i.e., an American flag, a car, and a tree for the pattern completion tasks. Successive problems require the children to deal with geometric forms, and so adhere to the basic format of the Matrices Test stimuli.

4. The requirements of the task are concretized in motoric performances, e.g., having the children draw the item that completes the pattern before choosing the various alternative solutions presented under the problem. In devising training for double classification problems it was found that children could easily derive one attribute at a time but often did not hold the first attribute in mind while they derived the second relevant attribute. During development of this training procedure the child's understanding was facilitated by having him draw the relevant attributes, one at a time, as he derived them. This helped concretize the elements of the solution process so that many children, after this type of practice could do the double classification problems

5. During the training on the double classification problems, after the children cease to draw the single attribute and begin doing the problems mentally, the children are required to indicate verbally how they arrived at the solution. T should have a student explain each solution in the group administration to avoid falsely assuming the students' understanding, when they may just be guessing.

6. The training procedure is very wordy, requiring continual explanations from the instructor, and periodic explanations from the children. The training procedure is difficult when working with low school achievers or EMR-type children, and the instructor must seek to minimize it by asking the children to point out the correct response; by talking for the children; by not requiring elaborate, detailed explanations of the students. Training should be as action oriented as possible for the students.

Method and Materials.

For group training, the training session should be scheduled the day after the pretest. The posttest should be the day after training. The training procedure is for small groups, e.g., five to 15 children depending on age and ability level.

Equipment: The instructor will need a carousel projector with remote control, a screen, and a pointer. A blackboard is also a good surface for projecting the pictures. It enables the trainer to draw missing parts or make x's on the stimulus materials. In this way, the trainer can provide graphic illustrations as part of the training.

Materials: The training procedure uses slides which correspond to pictures in workbooks which each child receives (see Appendix A). Thus, the child can follow the instructor's presentation on the screen and manipulate the stimuli by means of drawing the missing parts and identifying the answer in his book.

Each child will get a response booklet which he can later take home. Pencils and erasers should be brought by the children to the training session, although the instructor should have extras for emergencies.

Generally, there are two slides for each puzzle: the first one is exactly like the picture in the child's book; the slide following this stimulus slide has the correct answer filled in. So, for every workbook page there is a slide to present the problem followed by a slide with the solution.

Overview of Training Procedure.

Follow this procedure: show the first slide and help the children (or one child) to describe the pattern and the missing piece. Use a pointer whenever necessary. Then instruct the children to draw the missing piece in their booklets. Select one child to come up to the screen and point to the correct piece, while the other children mark with an x the correct piece in their booklets. Then, while the child is pointing to the solution, the instructor can switch to the slide with the answer to show him if he or she is correct. If the answer is incorrect, solve the problem *with* the child, asking him questions that will *lead* him to the solution. If children have drawn or marked an incorrect piece in their workbooks, they are instructed to cross-out or erase their mistakes and redraw and mark the correct piece. During the training session, the instructor should circulate amongst the children to check their work. Later in the training session, the instructor may omit requesting a description of the missing piece and start out immediately by having the children draw in the correct piece. *For the last ten problems*, the children *only* mark the correct piece in their workbooks and do not draw.

Circulate frequently amongst the children and encourage them to keep with you during training--stress looking up at the screen--booklets should only be used for recording responses. This should assure that no children jump ahead.

The training procedure should be introduced as an informal trick-teaching session. It should not be a lecture. Allow for plenty of student participation. This procedure has been found to be motivating and exciting to the students and a quick learning momentum is developed. The instructor will repeat the rules for solving the problems many times to insure the students' understanding.

Specific Instructions: The projector and screen should be set up before the children arrive. The first slide should be focused and the projector turned off. After the children are seated with sharpened pencils and erasers, the instructor should introduce himself to the children and explain to them what they will be doing.

(Holding up red Raven book): "Do you all remember the puzzles you did yesterday? Today, I'm going to show you some pictures like the puzzles in here and you will learn some tricks that will help you understand how to do these puzzles (hold up Red Raven's book) better when you try them again tomorrow. Now, I will give you a booklet of your own so we can all work together to understand how to do these puzzles better. You can draw your answers in this book and when we are finished, you can take them home with you.

(Pass out the workbooks): "Write your name on the front page of the book. This is your book to keep and I do not want you to lose it. Don't open the books yet. I will tell you when it's time to turn the page."

The instructor should attempt to learn the children's names if he does not already know them. During the initial training tasks, the trainer should interact with the group as a whole, but later, the children should be called on individually. When a child makes an error, he should be called again on another problem to be certain that he has corrected himself.

Now turn to the first slide.

"What we are going to do is learn some strategies or tricks to use in better understanding the puzzles you worked on yesterday. You did pretty well and now I am going to show you how you can do them even better tomorrow.

(Slides 1 to 5) "First of all, I'm going to show you how you can know a lot about somthing without even seeing the whole thing. Look at this first picture. What is it? (Responses sometimes given: curved line, ball, circle, head, etc.) Yes, it is a curved line and it could be a circle or a ball. Let's see a little more. (Change slide). Now the line is longer. Without saying anything out loud, see if you can draw on the cover of your book what you think this is going to be. If you don't know, just wait and I'll show you some more of it. (show slide #5). Look at this. (Allow some time for drawing then change slide.) Does everyone have it drawn yet? If not, look at this. (Change slide). Now, let's see what it is. A circle. How many drew a circle? Good. Look what you did. You saw a short line and tried to imagine what the rest of it could look like. Then you saw some more and you knew more about it. So from just looking at a little bit, you can have some idea what the picture will look like. (Change slide)

Design 1 Box (two slides #6, #7).

"Look at this slide and turn to page 1 in your books This first picture looks like the letter L. (Use pointer to point to each partial box.) In the next one, we don't know if this bottom line ends here or is going to continue on (show that the line can be lengthened.) So we have to look for more information. The next picture shows us that this line stops going this way and now goes up. Here it can continue going up or go in another direction. This last picture shows that it's going this way, but it's not finished. In your book, draw what you think the next picture will look like. Okay. Let's look at the next picture (Show slide #7). How many drew a box or a square? Good--very good. This time it was a little more difficult because we had to look for more information or clues. (Then review with children why this had to be a box.)

Design 2--Flag (3 slides, #8, #9, #10). "What is this?" A flag. (Expected reply) "Right. Is it a complete or whole flag?" No. "There is a part missing, yet all of you knew what it was. Draw the missing part in your book. Good. What did you do to it? Who can tell me? Right. You have to make the two black lines and one white line longer. To do that you had to look carefully at the picture. You looked at the design of the flag and followed the lines. (Go to second slide #9 with choices) Now look at the six choices you have at the bottom. Only one is the piece that finishes the picture. Is it this one (point to choice #4)? It has two black lines and a white one in the middle. No! Why? Okay, is it this one (point to choice #1). No! Why? How about this one (point to #5)? Good. This one looks just like what you drew here (point to missing piece and present slide #10 with the answer.) That was good. You looked at the design of the flag to find out what the missing piece should look like, then you looked at all the choices below to find the exact piece to fit the empty space, one that looked just like the piece you drew. Now mark the correct piece with an x in your book. Go to the next page. (Change slide)

Design 3--Complete car (Slide #11) "What is this? A car. Are there any missing parts? Look carefully. No. It looks complete to me, too. Turn to the next page. (Change to next slide).

Design 4--Car with missing wheel. (Slides #12, #13) "How about this car? Is there anything missing? Draw in your book the part that is missing. Now does your car look like this? (Show next slide of complete car.) Good, you remembered what the car looked like, and saw that it needed a wheel. Turn to page 5. (Change slide)

Design 5. Car with front or back missing. (Slide #14 and 15) "Look at this car. Without telling the answer aloud, draw in your book what is missing. (Circulate and check all books for right answer, that all are working and that all are on the correct page.) Good. Now look at the six choices below and put an x on the piece that looks like the one you drew, while __________ (call one child to come to screen) comes here and shows us the right piece. Why is it that piece? (Accept a correct explanation and expand it to:) Right, what is needed is the front or back of the car, depending on which way you think the car is going. One that looks like this side (point to left side of car) but faces in the other direction. It has to curve or be rounded here and have a wheel. Why can't it be this one (#3)? Right, you need more than just a wheel. Why can't it be this one (#5)?

It's going the wrong way and you can see this part in the picture. (Show slide with answer and have children mark answer with an x in their books, then show next slide.) Turn to the next page. Everyone should be on page 6.

Design 6--Outlined car (Slide #16 and 17) "Is this car like the other one? (Ss will probably respond yes.) It is? Look carefully. Right. The other car was black. This one is white. It is important to look at everything in the pictures. Here we have the same shapes (Indicate what part?)--cars, but inside the shapes (point) we can have something different. This one is white (go back one slide) and this one is black. (Return to white car slide). Now draw in the missing part in your book. (Check these). Good.Now mark one of the choices below with an x that looks like the piece you drew, while (child) comes here and shows us the right piece and tells us why that one. (Accept correct answer, also trying to get reasoning of previous design. Again expand the student's answer to get the elements of front or back, opposite of other side, curve-rounded trunk, and elimination of other responses.) Let's see if you're right. (Show answer slide.) Turn to next page. (Change slide to tree.)

Design 7--Tree (Slide #18) "What is this? Good. A tree. Is it any special kind of tree? Right, it could be a Christmas tree, pine tree. Fine, now turn to the next page. (Change slide) Everyone should be on page 8.

Design 8--Tree with missing trunk (Slides #19 and 20) "What is this? A tree with the trunk missing. Good. You picked that up quickly. (Ss usually see the missing part. If not, ask them to find the missing part.) Draw the part that is missing. Now, look at page 9. (Change slide.)

Design 9--Tree with branch and half trunk missing. (Slides #21 and 22) "Look at this tree. Without telling anyone, draw the missing part in your book. Now, while (name child) comes here to show us the missing piece, you mark it in your book with an x. Good. Now, why is this the correct answer? (If the response is not correct answer, use the following ideas to elicit the correct answer.) "The piece that is missing needs a part that looks like this (left side) but in this direction--(drawing with the pointer the angled branch and trunk.) We need another branch coming to a point and then the trunk. Why can't it be this one (#1)? No. (Point to branch.) Why not this one (#2)? Wrong side and it is already there. This one (#4) is wrong because it shows the whole tree. (Change to answer slide. Reinforce child at screen for correct response.) It has to be #5. Okay. Now turn to page ten. (Change slide).

Design 10--White Tree (Slides #23 and 24) "What is this? Is this tree the same as the other one? Look carefully. Good. This one has the same shape but it is a different color. It is white. Draw on your book the part that is missing. (When everyone completes the drawing, select one child.) (Child) come here and show us the missing piece and tell us why you chose that one. (The procedure is similar to the preceeding design.) (Show another slide).

"Turn to next page. (Change slide)

Design 11--Triangle (slide #25, page 11) "What is this? Good. A triangle. It's a triangle because it has three angles, (Point to them) and has three sides. Now turn to page 12 and let's see what we have. (Change slide)

Design 12--Triangle with missing angle. (Slides #26 and 27) "What is this figure? Right, it's a triangle with part of it missing. Finish the figure in your book. Now,mark the answer below with an x. Which of the six pieces is like the one you drew? (Select a child), come here and show us which is the missing piece and tell us why you chose that particular piece. Good. (pointing) If you extend this line and this one until they meet, they form the point which is missing. Why isn't this one (#2) right? Right, this is the point on the other side which is already there. This one (#1) is not correct because it is what the triangle should look like and not the piece that is missing. This one is right and if everyone drew it correctly it should look like this picture (Show slide with answer). You are doing well. You are looking at the design of the puzzle and every one of the answers in order to be able to choose the right one. Okay, now turn to the next one. (Change slide)

Design 13--Triangle in four pieces (slides #27 and 28) "What is this? Good, even though it's divided or cut up in four parts with one piece missing, you can still see that it is a triangle. In your books, draw the piece that is missing. (Use the same procedure as Design 12).

Design 14--White triangle in four parts. (Slides #29 and 30) (Same as Designs 12 and 13, except introduce this figure with the questions:) "What is this? Is this triangle the same as the other one? No. This one has the same shape but the inside is different. It is white. (Have children draw missing piece and then have one child come up to screen and point to correct piece.)

Orientation.

Design 15--Arrows down. (Slide #31, 32) "Now we are going to change the puzzles and we'll learn some different tricks. Here we have four boxes. What do we have in three of them? That's right, arrows. What should go in this box? Good. An arrow. Draw it in your book. Somebody (if it's mentioned) said that it should point down. (If arrow-down is not mentioned, ask which direction should the arrow point.) Why should the arrow go down? Right. Because the other three are pointing down so the last one should. Then is the answer #3? Why not? It's pointing down. Right. It has to point straight down. So which one is it? Right. Now mark with an x the correct one. Turn the page. All of you should be on page 16.

Designs 16 (slides #33 and 34) and 17 (slides #35 and 36) are similar to 15 and should be introduced likewise. (On the above 3 designs a child does not come up to the board to point.)

Design 18. Arrows to center (slides #37 and 38) "Don't say the answer. Look at this picture. Look at the arrows carefully. This is different than the last three pictures. Now, draw an arrow in your books and put an x on the right answer while (child) comes up here and shows us the correct answer. Tell us why you made your choice. (If the correct answer is not given, question the child using the following ideas so that he comes up with the correct answer.) Good. All the arrows are going to the center. Watch as I show you with the pointer. Start top left--This one is going down and into the center. The next one (top right) is going down and to the center. The next one (bottom-left) is going up to the center. This one has to go up and to the center. These three arrows give you clues on how the fourth one should look. The top two are going down and to the center and the one on the bottom is going up to the center. Therefore the other has to go up and to the center.

Design 19--Arrows away from center (slides #39 and 40) Use presentation similar to 18.

Design 20--Arrows down with changing focal point. (slides #41, 42) "Everyone should be on page 20. This one is tricky, but don't say the answer out loud. Look at all the arrows and then draw an arrow in the empty space. Now, mark with an x one of the six on the bottom which you think is correct. (Child), come to the screen and show us your answer and tell us why. (Accept some logical reason and at this point, say:) In the top row, we have two arrows and they are pointing down from one point. The one on the bottom is pointing down but into the middle. The other must do the same. This is tricky. So we have two pointing out in the top row, and two pointing towards the middle in the bottom row.

Design 21--Patch of flowers (slides #43, 44) "Look at this design. What is it? Who can tell me what we need to finish this design? I don't want the answer from below; I want to know how I can figure out the missing part. Ideas to convey:

1. All flowers are white with black centers.
2. Rows and columns have equal numbers.
3. Therefore, need a piece with 4 white flowers with black centers.

Locating answer:

1. Cannot be numbers 1, 3, and 5--only one figure.
2. #4 has too many flowers.
3. #6 are black flowers with white centers.
4. #2 is correct.

Have the children mark the answer with an x.

"Of course, you probably saw that #2 was the correct answer as soon as you saw it, but it's important that you look at all the answers just to make sure that it is the one correct answer. Turn the page. (Change slide).

Design 22--Blocks of four flowers. (slide #45, 46) "Here (on page 22) we have a design that looks like the other one. How is it different? That's right. This one is divided into four parts. Now look at the puzzle and figure out what the missing piece should look like. After you've figured out what should go there, look at all the six pieces below and mark the answer with an x. Meanwhile (child's name), will come here and tell us how to solve the puzzle and show us the answer. (Point out that the answer was the same for the last problem (#21)). Go to next page.

Design 23--One flower per block. (slides #47, 48) "What are these? What goes here? (point to empty space) Right, another flower. How did you know that? Right, all the other boxes had flowers and we need one exactly like the others--they're all the same.

Design 24--Large flower. (slides #49, 50) "What is this? Is this like the flowers on the last page? Right. It's bigger. It's a large flower divided into four parts. Look carefully at each of the three parts that are shown so that you can solve this puzzle. Mark the answer in your book while (name of child) shows us the answer and tells us why.

(Elicit:

1. Top two are going down to center.
2. Left side of bottom is going up to the center.
3. right has to go up to the center.
4. Must be a whole flower.)

"Go to page 25. (change slide)

Design 25--Rows of circles and triangles (slides #51, 52) "Look at this row of figures. Let's name each one. (circle, triangle, circle, triangle...) Now draw the one that should come next! Do the figures change? Right. Let's see. What is this? Circle. And this? Triangle. (etc.) Circle changes to triangle, then triangle changes to circle, etc. What can we say about what's happening? The shape changes. How many of you drew a circle? A triangle? (show slide with correct piece)

Design 26--Column of squares and circles. (slides #53, 54) (same as design 25) "Look at this column of figures. Do the figures change? Right. Let's see. What is this? Circle. And this? square (etc) (Continue with the rest of the column asking them to draw the figure which should come next (in empty space). How many of you drew a circle? A square? (show slide with correct piece) You can see the shapes can change going across like this (the row), and like this (down the column).

Design 27--Circles (slide #55) "What are these figures? Right. We have a circle, circle...(etc.) If we wanted to draw more figures, what would they have to be? Right. Circles. Here we don't have any changes. So this time we say the shape stays the same.

"Turn to page 28.

Design 28--Circles--filling in. (slides #56, 57) "Look at this line of figures. Does anything change? What is this first figure? Circle, next. circle, circle, etc. All of these are circles. So the shape stays the same. So what changes? Right. The inside changes. The circles are filling up. All the figures are the same shape--circles, with the insides changing. What should the next figure look like? Don't say it aloud. Draw it in your book! (Wait a few seconds and expose the answer slide.) Does everyone's drawing look like this? Here we have a circle that is all black. The shape didn't change, but the insides filled up slowly until we got an all black one. So the shape didn't change and the insides changed. From now on, we're going to talk about puzzles in which one thing stays the same and another thing changes.

"Turn to page 29.

Design 29--Figures with dots in a column (slides #58, 59) "What changes in this picture? The figures change. What is this (pointing to the first)? A circle. Then (have the children name the figures) triangle,etc. What changes? The shapes. What stays the same? Right (the insides) They all have dots on the inside. They are different shapes, but all have dots. Draw another shape that would go with these. What does it's shape have to be? That's right--any shape because the shape changes. What's inside? Dots

Dots--because the inside stays the same. (Important--the children should recite the rules with you).

Design 30--two rows--squares and circles (slides #60, 61) "Look at this picture. Look at the top row. What changes in this row? Right. The insides change. (Have children name the insides). What stays the same? They're all squares. So the shapes stay the same (E points to squares) and the insides change (E points to insides). Look at the bottom row. What changes? The insides again. (Have the children say the names of the insides, again). What shape are all the designs? Circles. (Circle, circle, circle, etc.--as you point). Now, we can also look at this picture going from top to bottom. Look at this column (first column on left). What changes? Good. The shape changes. (Elicit: square changes to circle). What stays the same? The insides stay the same. (Do this for all the columns). In this last column we have something missing.

"Draw in your books what you think the shape should be. Draw it. What should the inside look like? Draw it. (While Ss are drawing, check to see if anyone is having difficulties. When everyone is finished, show the answer slide). Does everyone's drawing look like this? A circle with lines.

"Let's go over how we got the answer. Looking at the rows every figure in the top row is a square. The shape doesn't change when we go along in this direction, so the shape doesn't change here (in the bottom row) when we go along in the same direction. Whatever stays the same when we go from here to here, (point to successive squares) stays the same when we go from here to here (circle, circle, circle). Since the bottom row is all circles, the last figure has to be what? A circle. In the top row, the insides change, so the insides also must change in the bottom row in the same way. When we look from top to bottom we see that the insides on the bottom are always the same as the insides in the shape on top. The last one has to have lines because the top one here (point) has lines. The missing figure must be a circle with lines.

Design 32 (slides #62, 63) "This time we have only four figures in the top row. Draw in your books what you think the figure should look like. Let's do it together. Look at the top row. What changes in this row? Right the insides change. (Have children name the insides). What stays the same? They're all squares. So the shapes stay the same (E points to squares) and the insides change (E points to insides). Look at the bottom row. What changes? The insides again. (Have the children say the names of the insides, again). What shape are all the designs? Circles. (Circle, circle, circle, etc.--as you point). Now, we can also look at this picture going from top to bottom. Look at this column (first column on left). What changes? Good. The shape changes. (Elicit: square changes to circle). What stays the same? The insides stay the same (Do this for all the columns). In this last column we have something missing.

"Draw in your books what you think the shape should be. Draw it. What should the inside look like? Draw it. (While Ss are drawing, check to see if anyone is having difficulties. When everyone is finished, show the answer slide). Does everyone's drawing look like this? A black or filled circle.

"Let's go over how we got the answer. Looking at the rows every figure in the top row is a square. The shape doesn't change when we go along in this direction, so the shape doesn't change here (in the bottom row) when we go along in the same direction. Whatever stays the same when we go from here to here (Point to successive squares) stays the same when we go from here to here (circle, circle, circle). Since the bottom row is all circles, the last figure has to be what? A circle. In the top row, the insides change, so the insides also must change in the bottom row in the same way. When we look from top to bottom we see that the insides on the bottom are always the same as the insides in the shape on top. The last one has to be black because the top here (point) is black. The missing figure must be a black or filled circle.

Design 33 (slides #64, 65) "Now there are only three figures in the top row. Draw in your books what you think the figure should look like. Let's do this one together too. Look at the top row. What changes in this row? Right, the insides change. (Have children name the insides). What stays the same? They're all squares. So the shapes stay the same (E points to squares) and the insides change (E points to insides). Look at the bottom row. What changes? The insides again. (Have the children say the names of the insides, again). What shape are all the designs? Circles. (Circle, circle, circle, etc.--as you point). Now, we can also look at this picture going from top to bottom. Look at this column (first column on left). What changes? Good. The shape changes. (Elicit: square changes to circle). What stays the same? The insides stay the same (Do this for all the columns). In this last column we have something missing.

"Draw in your books what you think the shape should be? Draw it. What should the inside look like? Draw it. (While Ss are drawing, check to see if anyone is having difficulties. When everyone is finished, show the answer slide). Does everyone's drawing look like this? A circle half filled or half black.

"Let's go over how we got the answer. Looking at the rows every figure in the top row is a square. The shape doesn't change when we go along in this direction, so the shape doesn't change here (in the bottom row) when we go along in the same direction. Whatever stays the same when we go from here to here, (point to successive squares) stays the same when we go from here to here (circle, circle, circle). Since the bottom row is all circles, the last figure has to be what? A circle. In the top row, the insides change, so the insides also must change in the bottom row in the same way. When we look from top to bottom we see that the insides on the bottom are always the same as the insides in the shape on top. The last one has be be half filled or colored half black because the top one here (point) is half filled or half black. The missing figure must be a circle colored half black or half filled.

Design 34 (slides #66, 67) 2 x 2 design. "This time we have only two figures in the top row and only one in the bottom row. What happens in the top row? (Children should now have the routine; say square stays a square but the inside changes). Okay, now whatever happens in the top row must also happen in the bottom row. What must happen in the bottom row? Right--circle stays a circle but the inside changes. Draw the missing shape in your books.

Now what goes inside? How did you know it had to look like that? Before you had a whole row of circles and that told you the missing shape must be a circle; this time you only had one circle. You knew because the top row told you that the shapes stay the same and--(from the children) whatever happens on the top row must happen on the bottom. So the missing piece at the bottom must stay the same as the one circle in the picture because the shape stays the same up here (point to top row). The inside has to change because it changes up here (point). Draw the shape of the missing figure and then what it should look like inside. (Go over the solution with the group). 1. What changes in the top row must change in the bottom row. 2. What stays the same in the top row must stay the same in the bottom row. The same rule is used for columns, too (explain it pointing as you go).

Design 35--two rows of figures (slide #68) "Draw in the shape of the missing figure in this problem. Now what must the inside look like? (check the students' drawings). Who wants to tell me how he figures this out? Yes. A triangle on a point with lines. (Go over the explanation of "change" and "same" by rows and columns) (see #34).

Show answer slide.

Designs 36 to 42, 2 x 2 analogies (slides #69 to 82) The next series of training designs are 2 x 2 designs where two figures are in the top row and one in the bottom row and the lower right design is missing. Have the students look at the designs and begin the work exercise by having them draw the shape of the missing figure first. Then they can draw what the inside should look like. Remind them to think of the rule of what changes and what stays the same as they proceed. After they have drawn in the missing figure have them cross out the correct choice below, while a child comes to the screen to choose the correct answer and explain the reasons for their choice. If they have difficulty verbalizing the rule, ask them questions: "What changes?" "What stays the same?" first by rows and then by columns. After each problem, T states the rule. 1. Whatever happens in the top row must also happen in the bottom row. 2. (pointing to top row). When you go from here (left) to here (right) something changes and something stays the same. (It's easier for the student to work on the shape first--if the shape changes give the rule for "changes" first; if it stays the same then the rule for "same comes first.") 3. What changes? The shape changes. The (shape) changes to a (shape). 4. So what must happen in the bottom row? The shape must change because it changed in the top row and it must change in the bottom row in the same way. Draw in the correct shape in your books. 5. What stays the same in the top row? The (inside) stays the same--okay if the (inside) stays the same in the top row it must also stay the same in the bottom row. Color in the inside.

Then call one child to the screen to point out his solution and to have him explain it. Show answer slide. Review rules. Whatever happens in the top row must happen in the bottom row. In the top row the (shape 1) changed to a (shape 2) so in the bottom row (shape 1) must change to a (shape 2). In the top row the inside stayed the (same); in the bottom row the (inside) must stay the same.

Designs 43-57 (slides #83-110) The students do not have to draw the missing figure but should cross out the correct choice below. If the child does have problems note these and have him continue to draw. *T* may want to take him aside for individual help later. For each design, try to get someone to verbalize the rule. There are enough problems or designs to give everyone an opportunity to come to the board. If someone had difficulties in the training sessions, you might give them more than one chance to answer. If you think someone doesn't understand, call on them. Call back to the screen children who made mistakes earlier but be ready to help them verbalize answer without them feeling downgraded or punished. Each time mention the rule for solution before going on to the next slide. This can be done very quickly without becoming monotonous. "In the top row the shape (or inside) changed from __________ to __________ so in the bottom row it changed from _________ to _________. In the top row the inside (or figure) stayed the same. So in the bottom row the _________ stays the same. Going down the figure (or inside) stayed the same and the inside (or figure) changed.

Look for children whose performance gets sloppy because they are not looking at the problem, and choose an alternative too quickly. Take care to have him "construct" the design verbally, one attribute at a time before the entire group, with *T* providing any necessary verbalization for his pointing, or other nonverbal behavior. One is trying to build in a systematic attack on the problems and *E* must seek to assure proper development and reinforcement of a systematic, more reflective solution process.

If S's performance remains unsatisfactory, and he seems not to be comprehending the analogy process, using drawing and explanation with choices covered, you may wish to schedule an additional training session to review the analogy process either individually with a child, or in a small group -- up to 8 children per trainer.

INTRODUCCIÓN

La Prueba Raven de Matrices Progresivas se administra como sigue:

a) Para niños de hásta 11 años de edad (incluido), administre los grupos:

A
A_B } Estos grupos están en la libreta roja
B_A

b) Para niños de 12 años de edad en adelante, administre los grupos:

A
A_B } libreta roja
B

C
D } libreta marrón
E

Direcciones para la Administración de la Prueba Raven

(para todas las edades)

Cuando los estudiantes estén sentados en el salón, déles un lápiz y una hoja de respuestas. Pideles que escriban su nombre y apellido en la parte de arriba de la hoja de respuestas.

En el pizarrón dibuje los ejemplos A.1 y C.1 (a doble tamaño approximadamente) y un ejemplo de la hoja de respuestas.

Dé a cada alumno una libreta roja y digales: "Abran sus libretas en la primera página (la página verde). Fíjense que en la parte de arriba está escrito "Set A". Ahora miren en la página de respuestas que tienen una columna "A" (muéstreles la página). En su libreta el primer problema es A.1. ¿Lo ven? A la figura de arriba le falta un pedazo para completar su diseño: "Ahora miren la parte de abajo. Tienen varias figuras, y solamente una de ellas es la que le falta al dibujo de arriba para estar completo. Vamos a ver si hallamos cuál tiene el diseño correcto. Numero 1 (enséñales con su dedo) tiene la forma correcta, pero el diseño no es correcto. Pasa lo mismo con los números 2 y 3. Los pedazos tienen la forma correcta pero el diseño no es igual al de la figura original. ¿Qué dicen Uds. del número 6? Este pedazo tiene el diseño correcto (muéstreles que el diseño es correcto) pero no está completo. Una parte es blanca.... Indique con el dedo la contestación correcta.... (pausa).... Bien, número 4 es correcta. Entonces la contestación para A.1 es 4.

"¿Entendieron lo que deben hacer? (Repita brevemente: hay una figura incompleta y hay que hallar el pedazo que le hace falta, es igual que en una rompecabezas) etc..... una vez que tenemos la respuesta la escribemos en la hoja de respuestas, aquí"... etc.). "¿Hay preguntas?"

"En cada página de la libreta hay una figura a la que le falta una parte. Uds. tienen que decir cuál de los pedazos de abajo es el que hace falta para completar la figura de arriba (Fíjense bien que solamente uno es correcto), igual que con una rompecabezas). Cuando estén seguros de cuál es el pedazo correcto, escriban el número del pedazo en la página de contestación, al lado del número de la figura."

Los problemas (o rompecabezas) son fáciles al principio, pero al final son mas difíciles. No hay trampas. Si ponen atención cómo conseguir la contestación a los problemas fáciles, encontrarán que los otros no son tan difíciles.

Vamos a hacer otro problema. Pasen a la próxima página que es de color naranja y fíjense que le falta un pedazo para estar completa. Ahora, miren cuidadosamente los seis pedazos abajo. Uno sólo es totalmente correcto. Escojan el pedazo que Uds. piensan es correcto y escriban el número del pedazo al lado del número 2 en la columna A de su página de contestación.... (pausa).... La contestación correcta es el número 5. Asegúrense que tienen el número 5 escrito al lado del número 2 en la columna A. ¿Hay preguntas?

Ahora sigan con los otros problemas. Escriban las contestaciónes en el espacio correcto en la página de contestación. Por ejemplo, cuando terminen con el problema A.12 lo siguiente es A_B1 y deben escribir la contestación de ese problema en la columna que tiene A_B arriba (es decir, la segunda columna).

(Para estudiantes de 12 años de edad y mayores, digales: "Cuando terminen con esta libreta levanten la mano, y les daré otra libreta con más problemas.")

(Para todas las edades), concluya diciendo:

"Trabajen como quieran. No hay limite de tiempo."

Nota a las maestras: Fíjense (individualmente) cómo están contestando las preguntas. Asegúrense que están escribiendo las contestaciones en los espacios correctos en la página de respuestas. Cuando el estudiante termine con el grupo B de la libreta roja (solamente a los de 12 años de edad en adelante) dele la libreta marrón con la página de contestación marcando el grupo C. Digale: "Ahora comienza con este grupo (el grupo C) y escribe la contestación al lado del número 1 de la columna C en ~~esta~~ página de contestación."

Diga a los estudiantes que traten de hacer lo mejor posible y que si no pueden contestar un problema, que lo dejen y sigan con los otros. Si quieren, pueden adivinar cuál es la contestación correcta.

Para la administración de la misma prueba después del adiestramiento digales: "Ustedes recuerdan estos rompecabezas. Los hicieron una vez. Ahora tendrán otra oportunidad de enseñarme lo que pueden hacer." La administración es igual que la anterior.

Procedimiento de Adiestramiento

Durante el proceso de adiestramiento el estudiante debe resolver una serie de problemas. La idea esencial es que el estudiante se dé cuenta de cómo debe enfocar los problemas, para lo cual el (la) maestro(a) le ayudará a comprender de qué se trata el problema y cómo resolverlo.

Como es necesario que el estudiante entienda el problema y encuentre la manera de resolverlo, después que Ud. le explique el tiene que tratar por su cuenta y la ayuda se le debe dar cuando no entiende o fracasa. Si el maestro(a) le resuelve todos los problemas sin que el niño se esfuerze, difícilmente entenderá cuando se lo deje por su cuenta. Por otra parte, si no se la ayuda suficientemente, el niño se sentirá frustrado, perderá interés y el adiestramiento resultará en una experiencia negative.

Más adelante se dan instrucciones específicas de cómo administrar el adiestramiento, pero siempre quedará a criterio del maestro intervenir en la manera más oportuna para que el niño (a)entienda los problemas y (b) para que tenga una experiencia agradable. Por supuesto, las intervenciones no deben violar las instrucciones especificas sino más bien implementarlas en la manera más adecuada a las circunstancias y a cada estudiante en particular.

Este procedimiento de adiestramiento ha sido usado con niños de 6 1/2 años de edad en adelante. El procedimiento completo, incluyendo los diseños 3 x 3, ha sido usado con adolescentes de 16 y 17 años de edad. Probablemente son útiles para personas mayores porque no se necesitan adaptaciones para sujetos de 17 años de edad y mayores.

Adiestramiento con estudiantes jóvenes.

Use la siguiente tabla.

Edad	Termine entrenamiento con #	Termine la sesión con #	Observaciones
menores de 7 años	35	18	
7-9 años	40	27	Pare con el # 35 si el niño no entiende.
9-11 años	49	27	No le enseñe diseños 3 x 3.
mayores de 11 años	completar la libreta (# 65)	27	El segundo día repita # 26 y 27 y siga hasta el # 65. Incluye problemas 3 x 3.

NOTA:

Usualmente se requieren 2 días o 2 sesiones dependiendo de cómo el niño coge las ideas de completar diseños.

Si el progreso es lento, sería mejor terminar la primera sesión después del problema # 18. Si el estudiante puede hacerlos en 10 minutos o menos, siga con el adiestramiento de los problemas 2 x 2* que comienzan con el # 20. La primera sesión usualmente termina con el # 27.

*Problemas: 1 x 1 ☐ 2 x 2 ☐ ☐ 3 x 3 ☐ ☐ ☐
☐ ☐ ☐ ☐ ☐
☐ ☐ ☐

Para sujetos mayores (EC 11-0 años) el adiestramiento sigue adelante incluyendo los problemas 3 x 3, hasta terminar la libreta. Usualmente el adiestramiento dura dos días. Primer día hasta # 27 y el segundo, repitiendo # 26 y 27 hasta el # 65.

Instrucciones Específicas

Todo lo que está subrayado es lo que Ud. debe decir.

Primera sesión de adiestramiento

E = maestro(a)   S = estudiante

E tome un pedazo de papel y diga:

"Quiero que tú ves lo que estoy dibujando. Voy a dibujar algunas figuras. Mira bien lo que estoy haciendo. Verás que los dibujos cambian de cierta manera."

"Dibuja aquí lo que sigue" (indicando el espacio que sigue en el papel).

"Bien, muy bien. Aquí tenemos un pedacito, un poco más, otro poco más, más, y finalmente lo que tú dibujaste. ¿Cómo se llama lo que tú dibujaste? (un círculo, anillo, o lo que S dice.)

"Ahora, mira ésto." E dibuja lo siguiente:

"Dibuja lo que debe estar aquí."

"Lo hiciste bien." (no es necesario que S complete la figura.)

"¿Cómo se llama esto?" (enseñandole el cuadrado)

"Ahora vamos a mirar algunas figuras que ya han sido dibujadas. Abran el libro en la página 1. ¿Cómo debe ser el diseño próximo?"

I. Completando el diseño.

--- Diseño 6 - Bandera:

Con las respuestas cubiertas pregúntele:

"¿Qué es ésto?" "¿Qué hace falta?" ... Quite la cubierta.

"Enséñenme el pedazo que completa este diseño."

Si S no puede indicar el pedazo correcto, cubra nuevamente las respuestas. Pidale que le indique a Ud. qué es lo que falta en la figura. Haga que el niño mueva su dedo varias veces por las rayas de la bandera y pregúntele "¿Qué son éstos?" "¿El pedazo que falta debe tener ________?" "Si, rayas." (Descubra las respuestas.) "¿Cuál de las respuestas tiene rayas como éstas?" Si éstas preguntas no ayudan a S a resolver el problema, pruebe con una de éstas variantes:

a. Dibuje las rayas de la bandera en un pedazo de papel y póngalo en el espacio correspondiente. E indica con el dedo que las rayas van en esta dirección.

Descubra las respuestas y pregunte al S, "¿Cuál de los seis completa mejor la figura?"

--- Diseño 7 - lata de sopa:

Igual a # 6 - Si *S* tiene dificultades, dele ayuda dibujando la lata con el dedo del *S*.

--- Diseño 8 - Dibuje esta figura en el papel. *E* debe hacer que *S* se fije en las esquinas de la parte baja de la figura, dando énfasis a la forma > de las esquinas. Haga ésto con una pluma en el dibujo de *S*. Guarde el dibujo para los problemas siguientes.

--- Diseño 9 - Cubra las respuestas abajo y diga, "*Ésta figura tiene la misma forma que la que acabas de dibujar*. *Enséñame con el dedo cuál es el pedazo que falta*. *Ahora dibujálo*. *Bién*. *Descubra las respuestas*. *¿Cuál de éstas seis respuestas es el pedazo que va en éste espacio*?"

Opción 1. Si la respuesta es incorrecta, cubra las respuestas, ponga las figuras # 8 y # 9 una al lado de la otra y diga,- "*Ahora enséñame con el dedo como debe ser el pedazo que falta*? *Bien, busca aquí* (descubra las respuestas) *el pedazo que completa la figura*."

Opción 2. Si *S* todavía tiene dificultades, ponga la figura 9 encima del # 8 y póngalos frente a una luz brillante. Diga,- "*El pedazo que falta debe verse como ésto.*" Enséñele con el dedo y diga que él también lo haga con su dedo. "*Bien*." "*Ahora, dibújalo aquí en el papel y escoge la respuesta que completa la figura*." Si *S* no pueda resolver el problema, pase al próximo.

Opción 3. Para niños de muy corta edad o niños que tienen muchas dificultades cogiendo la idea del problema, *E* debe dibujar en el papel lo que *S* dibujó con el dedo, diciendo, "Éste es el que tú dibujaste con el dedo. ¿Cuál de las respuestas de aquí (indique) es igual a tu dibujo? Si el niño quiere hacer el dibujo él mismo, deje que lo haga.

--- Diseño 10.- "Aquí tenemos una figura igual a lo que tú dibujaste pero esta dividida en pedazo. Mira aquí abajo (las respuestas) y enséñame cuál es el pedazo que le falta." Si hay dificultades con esto, cubra las respuestas. Use la opción 2 (# 9). Diga, "Dibuja con el dedo el pedazo que le falta (en el espacio vacío).... Ahora dibújalo en el papel." Descubra las respuestas y diga al S que halle el pedazo que completa la figura. También puede usar opción 3 (diseño # 9), si lo estima conveniente.

--- Diseño 11. "Aquí tenemos otra figura como la que tú dibujaste. Ésta tiene solamente el esbozo de la figura y está dividido. Mira aquí (las respuestas) y enséñame el pedazo que falta."

Use opciones 2 y 3 (# 9) si es necesario.

II. Orientación de los Elementos en una Figura.

--- Diseño 12 - Indicando con el dedo una de las figuras arriba diga, "¿Cómo se llama ésto?" Si S no puede darle un nombre, E lo da (escudo, flor, insignia) y diga, "Vamos a llamarlo una insignia. Mira, es grande arriba y termina abajo en forma de punta." Muéstrele las respuestas y pregúntele, "¿Cuál de éstas piensas tú que debe estar aquí (indicando el espacio vacío)? Si S tiene dificultades, cubra las respuestas y diga, " En qué dirección va la punta de ésta?" (insignia izquierda arriba) - "¿Y ésta?" (arriba a la derecha)

"¿Y ésta otra?" (abajo, izquierda).... "Entonces la punta siempre está abajo." Descubra las respuestas."¿Ahora cuál de éstas tiene la punta hacia abajo?"

Si S todavía tiene dificultad, tome un lápiz con punta y diga, - "Pon el lápiz en la misma dirección que va la insignia (izquierda arriba). Haz lo mismo con lapices por las otras insignias. Después pregunta S, - " En qué dirección debe ir éste lapiz (figura baja derecha). Entonces escogela (insignia) que debe estar aquí."

--- Diseño 13 - " Qué piensas tú debe estar aquí?" Si S tiene dificultad, muéstrele cada insignia y pregúntele, - " En qué dirección va ésta?"etc. Entonces " Cómo debe estar la última? Enséñame la que es correcta." Trata de no darle muchas instrucciones verbales, a menos que no entienda el problema. Trate la estrategia de los lápices si es necesario.

--- Diseño 14 - 16 - Igual a # 13.

--- Diseño 17 - "Ésta es mas difícil. Presta atencion para que no te equivoques. ¿Cuál pedazo debe estar aquí?" Si S tiene dificultad con esta, dígale que use el lápiz. (Vea las instrucciónes, # 12.)

--- Diseño 18 - Igual a # 17.

Introducción al adiestramiento en Analogías

--- Diseño 20 - E muestra las figuras una por una, empezando de arriba y pregunta, -"¿Qué es ésto? (cuadro).... Y ésto? (círculo)... y ésto, y ésto...?" pidiendo contestaciones dos figuras imaginarias más de las que están presentes (último cuadro). Ahora preguntele, - "¿Cómo sabía que éstas figuras (el circulo y cuadro imaginarios) siguen?" (Use el mismo nombre que S da a las figuras cuando está identificando figuras particulares.) Ahora muéstrele el patrón del problema diciendo, - "Primero hay un cuadro, después un circulo, después un cuadro, un círculo, un cuadro, y para continuar con el patrón se necesita un círculo, después otro cuadro.

--- Diseño 21 - Aquí tenemos otra figura. Muéstrele el espacio vacío al fin de la fila y pregúntele, - "¿Qué debe estar aquí?.... ¿Y después de eso?" Si S no contesta correctamente o espontáneamente continue como con el # 20. E muestra las figuras y S nombra las figuras - círculo, triángulo, círculo, etc., hasta tres o cuatro figuras más que las que están presentes.

--- Diseño 22 - Muestre el espacio después del último círculo y pregunte al S - "¿En éste figura, qué debe estar aquí?" Si S no contesta correctamente, pregúntele, - "¿Qué son éstos? ¿Si pongo más, qué debe ser?" O si S no entiende, enseñele cada círculo uno por uno, y pregúntele, - "¿Qué es ésto, y ésto, y ésto? etc. Todos son círculos. Cuando no hay cambios de una figura a otra, podemos decir que todas son iguales.

--- Diseño 23 -"Dibuja lo que debe estar aquí." (Enséñele el espacio después del último círculo y de a S un pedazo de papel.) Si S dibuja la contestación correcta, E dice, - "¿Cómo sabías que tenía que ser un círculo? ¿Está bien? Todos son círculos, entonces éste tenía que ser un círculo también. ¿Cómo sabí[illegible] que había tenido que ser todo negro?.... Bien, muy bien. El interior de los círculos está más negro que el anterior hasta que tú dibujaste un círculo completamente negro.

Si la contestación del niño es incorrecta, muéstrele los círculos y diga, - "¿Mira, qué es ésto (círculo), y ésto (círculo)?" etc. hasta que todos son identificados. ¿Qué tiene que ser éste? (S: un círculo) Dibújalo (en un pedazo de papel). Ahora, vamos a ver el interior de los círculos. ¿Qué pasa del círculo 1 al círculo 2? (S: más negro, más lleno o algo parecido.) ¿Del círculo 3 al círculo 4?" (S: también más negro.) y lo mismo hasta cuando llega al ultimo circulo que falta. - "¿Cómo debe verse el círculo tuyo? (S: negro entero) E: Dibújalo."

"A partir de éste problema tenemos que poner atención a dos cosas en cada figura; algo que queda igual de una figura a la otra (como los círculos) y algo que cambia de una figura a la otra. ¿Qué cambió aquí...? ¿Qué quedó igual?

--- Diseño 24 - "¿En esta figura, qué cambia y qué queda igual?" Si S contesta solamente una propiedad, pregúntele por la otra, diciendo, - "Bien, éstos quedan iguales (o cambian) y en qué (o cuáles) cambian (o quedan iguales)? Cuando S contesta con las dos propiedades, E lo repite, diciendo, - "Si, esa es correcta, la de afuera (figura o forma) cambia y por dentro (interior) queda igual.

Para niños jóvenes, puede ser necesario que Ud. deba explicarles con más detalle. E muestra la primera figura y dice, "¿Qué es ésto?" (Usa los nombres que S le da para las figuras. E puede decirlos cuando S no lo sabe.) Después de contestar: un círculo, o redonda, etc., E continúa la línea de las figuras preguntando, - "¿Qué es ésto?" para cada forma. E dice, - "El círculo cambia a triángulo, el triángulo cambia a cuadrado, etc., mostrando cada uno con el dedo. "Entonces, todas las figuras son distintas. Vamos a ver qué queda igual en cada figura. Tal vez será necesario enseñar la idea de igual en la siguiente manera. Muestre los interiores de cada figura, diciendo:

E: - ¿Qué hay aquí dentro? (mostrando el círculo)
S: - Puntos (puntitos)
E: - ¿Y aquí? (mostrando el triángulo, haga lo mismo con cada figura)
E: - ¿Qué está dentro de todas las figuras?
S: - Puntos
E: - Bien... Entonces ¿Qué es lo que queda igual?
S: - Los puntos
E: - Correcto, el interior de cada figura queda igual.

--- Diseño 25 - "¿Qué queda igual en ésta figura? y qué cambia?"

--- Diseño 26 - (2 x 2: (2) filas y (2) columnas) Cubra la fila de abajo y muestra la fila de arriba. "¿Qué cambia, y qué queda lo mismo aquí?" Cuando S contesta correctamente, cubra la fila de arriba y hágale la misma pregunta. Pregúntele por la segunda propiedad si no lo menciona. Si S tiene dificultad con una u otra fila, muéstrele cada figura en turno y trate de que el sujeto descubra y mencione cada propiedad, una por una, usando los dos elementos de la pregunta inicial como están explicados en las instrucciones pare el diseño # 24.

Ahora, cubra todas las figuras excepto las dos en la columna a la extrema izquierda y pregúntele, - "¿Que queda igual y qué cambia cuando se va de aquí (muestre el cuadrado) a aquí (muestre el círculo)? Bien, el cuadrado cambia a un círculo y ambos tienen rayas por dentro. Pase a la próxima columna y repita la pregunta, trate de que S mencione ambas propiedades como lo hizo para la primera columna. Siga exactamente de la misma manera para las próximas dos columnas, dejando las columnas descubiertas. Para la columna a la extrema derecha, pregúntele, - "¿Qué figura debe estar aquí?" mostrando el espacio vacío. "Dibújalo." Otra vez haga que S nombre ambas propiedades. Si la respuesta es correcta dígale, - "Muy bien."

Dele un repaso del material presentado, empezando con la columna 1: "Veamos, el cuadrado cambió a un círculo, las rayas quedaron iguales. En la segunda columna el cuadrado cambió a un círculo, y los puntos quedaron iguales. En la tercera columna .... etc. etc." Comenzando con la columna a la izquierda, muéstrele el cuadrado y el círculo diciendo, - "Todo lo que cambia del cuadrado al círculo también cambia de aquí (cuadrado - segunda columna) a aquí (circulo) y de aquí a aquí (columna 3) y de aquí a aquí (columna 4) y de aquí a aquí (columna a la extrema derecha). Entonces, ésta figura debe ser un.... ¿Qué? (círculo) ¿Porqué? ¿Qué queda igual o lo mismo de aquí a aquí (columna izquierda) queda igual de aquí a aquí (columna 2) y de aquí a aquí (columna 3) y de aquí a aquí (columna 4)? Y tiene que quedar igual de aquí a aquí (columna 5). ¿Entonces, el interior de este círculo tiene que tener...? ¿Qué?

--- Diseño 27 - Cubra la fila de abajo. "¿Qué cambia y qué queda igual o lo mismo en ésta fila?" Haga que S mencione ambas propiedades (forma o figura cambia pero el interior queda igual). Ahora, cubra la fila de arriba y pregunte a S en la fila de abajo. "¿En ésta fila qué cambia y qué queda igual?" (formas cambian, y los interiores quedan igual.) Cubra todas las figuras excepto la columna izquierda y dele las instrucciones igual que con el diseño 26, dando énfasis a lo que cambia y a lo que queda igual. Comience con la columna izquierda, después muestra la columha a la derecha y siga columna por columna de la derecha a la izquierda hasta cuando llega a la segunda columna de la mano izquierda. Siempre pregúntele las mismas preguntas, y haga que nombre ambas propiedades. Diga a S, - "Dibuja la figura que falta", y después déle un repaso.

Éste es el fin de la primera sesión. Para todos los niños menores de 12 años de edad, continúe con la segunda parte en otro día. Niños mayores de 12 años de edad, podrán continuar con la segunda parte si la primera parte no les toma más de veinte (20) minutos. Pare cuando el niño se cansa.

Parte II

Si el entrenamiento total no se completa en una sola sesión, entonces comience la segunda parte con un repaso de los diseños # 26 y 27, repasando con el S lo que ya hizo al fin de la sesión anterior. Cuando termine con el repaso, empiece con el # 28. Si el adiestramiento se lleva a cabo en una sola sesión, pase al diseño # 28. - "Aquí tengo otro problema que se parece al último que hicieron, pero con algunas diferencias." Dele énfasis primero al cambio de forma y pregúntele, - "¿Qué cambia de aquí a aquí? Nuestra regla dice que si el cuadrado cambia a un triángulo, el cuadrado aquí (abajo) tendrá que cambiar de la misma manera. Dibuja la figura que debe estar aquí."

"Ahora, fíjate en la parte de adentro de las figuras. Otra vez usa la regla. El cambio de aquí (fila de arriba) a aquí (última de la primera columna) tiene que cambiar aquí tambien (segunda columna). Dibuja lo que va dentro del triángulo." Si S contesta correctamente, use # 29 para asegurarle, indicando la solución correcta.

Si S tiene dificultad con # 28, use # 29 para ayudarlo con la solución. "Así debe verse cuando todo está terminado. Todos los cambios que tiene de aquí (arriba izquierda) a aquí (arriba derecha) debe tener de aquí (abajo izquierda) a aquí (abajo derecha). Es igual al problema que hicimos aquí (muéstrele # 27). Dibuja la figura que falta (digale que copie la figura de # 29). Desde éste problema en adelante, voy a darles problemas o rompecabezas, con éste pedazo faltando (muéstrele el pedazo de abajo a la derecha)."

--- Diseño 30 & 30 A - Cubra las respuestas de abajo. Dele énfasis al cambio de forma y pregúntale, - "¿Qué cambia de aquí a aquí?" (mostrando la fila de arriba). Después muéstrele la fila de abajo y pregúntele, - "¿Cómo tiene que ser ésta figura? (Mostrando el espacio vacío.) Dibújalo aquí (dele un pedazo de papel). Ahora, ¿Qué cambia de aquí (arriba a la izquierda) a aquí (abajo izquierda)? ¿Qué tiene que cambiar de aquí (arriba a la derecha) a aquí (espacio abajo a la derecha)? Dibújalo.

Si S contesta correctamente, muéstrele primero a lo largo de la fila y después hacia abajo de la columna, diciendo, - "Círculo a cuadrado, círculo a..., mitad negro a rayas, mitad negro a... Descubra las respuestas y diga, - "Bien, mira el rompecabezas. Busca el que dijiste que va aquí. (indica el espacio vacío) Si S no lo entiende, refiérale a su dibujo y dígale que escoja el pedazo que se parece a su dibujo.

Si S contesta incorrecto con el dibujo, dígale, - "Vamos a ver otra vez." Mostrando primero la fila de arriba izquierda a derecha y lo mismo para la fila de abajo, dígale, - "Círculo a cuadrado, círculo a ....?" (Deje que el niño conteste. Si no puede, dígale 'cuadrado'.) Recuerda lo que cambia de aquí a aquí (fila de arriba) tiene que cambiar de aquí a aquí (fila de abajo). "¿Qué cambia de aquí a aquí? (fila de arriba) Bien, el círculo cambia a un cuadrado de aquí a aquí. Entonces éste círculo tiene que cambiar a un triángulo (fila de abajo). Ahora, dibuja el cuadrado. Enseñe al niño a compreneer que con el interior debe proceder de la misma manera. Después pase al diseño 30 A y diga, - "Aquí lo tenemos como debe verse." Repita, - "Lo que cambia de aquí a aquí tiene que cambiar de aquí a aquí, etc. Descubra las respuestas digale, - "Escoge la respuesta correcta."

--- Diseño 31 & 31 A - Igual a 30 & 30 A.

Si S entiende bien el concepto de analogía al fin del diseño 31, continúe con los diseños 31 al 49. Para los diseños 32 - 35, con la respuesta cubierta, diga al niño que dibuje la figura que falta. Dele un repaso de la solución por analogía (enseñando cambio de forma primero). Y finalmente diga al niño que escoja la contestación correcta de entre las respuestas en la parte baja de la página. Si el niño hace el trabajo bien, el niño no tiene que dibujar la respuesta. Es suficiente si S puede decirle a Ud. cómo debe verse la figura. Después descubra las respuestas y dígale a S que le enseñe con el dedo la contestación correcta. Si S no entiende el proceso de analogía, continúe con los dibujos.

--- Diseños 41 - 49 - S indica la contestación con el dedo y las respuestas quedan descubiertas. Si S no está dibujando ni construyendo verbalmente la figura que falta, por cada tercer diseño pregunte a S porqué escogió esa contestación - indicando el proceso de resolver el problema. Esta es una manera de chequeo para que el niño no sea descuidado o adivine las contestaciones.

Si la ejecución del S no es satisfactoria, y Ud. cree que no comprende el proceso de analogía, aún cuando E usa los dibujos y explicaciones, termine el adiestramiento con el diseño # 40 si S tiene más de 9 años de edad (pero menos de 11). Si el S tiene más de 11 años de edad, continúe el adiestramiento con los diseños 3 x 3, comenzando con # 50.

Adiestramiento con los Diseños 3 x 3

Los diseños 3 x 3, comenzando con # 50, se administran solamente a los Ss que tienen 11 años de edad y en adelante (EC). Si S tiene menos de 12 años de edad y tiene dificultad con los problemas de restar (# 59 y los siguientes), administre solamente los dos últimos diseños y termine el adiestramiento. El orden de las páginas en el libro de adiestramiento debe ser así 50, 51, 52, 53, 54, 57, 55, 56, 58, 59, 61, 60, 62, 63, 64, 65, 66, y 67. Las últimas dos páginas (66 y 67) son una repetición de los conceptos presentados en los diseños 26 y 27.

Ahora vamos a trabajar con unas rompecabezas diferentes.

--- Diseño 50 - E muestra la fila de arriba con el dedo, diciendo "Casa, sol, triángulo; sol triángulo, casa; triángulo, casa, ______?" El S tiene que contestar qué figura siga las dos primeras. Si el S no dice 'sol' pregúntele por la figura que falta. Si S todavía no le responda, dele un repaso de la regla que es, - "¿Qué pasa aquí (enseñele la primera fila) tiene que pasar aquí (segunda fila) y aquí (tercera fila). Ahora, en la primera fila hay tres cosas, una casa, un sol, y un triángulo. En la segunda fila hay lo mismo. Entonces la tercera debe ser lo mismo. ¿Qué figura la hará igual a las otras filas?

--- Diseños 51 y 52, adminístrelos como # 50, primero dando S el cambio de las figuras. Cuando S trabaje cómodo con el proceso enséñele que la regla también sirve para las columnas. (Recuérdele que en los problemas 2 x 2 habían cambios consistentes para las columnas, use página 26 como un ejemplo.)

--- Diseño 53 -"Éste rompecabeza es igual a los anteriores pero tienes que poner atención à la forma de la figura y lo que está dentro (el interior). Si S no contesta correctamente enséñale la solución parte por parte, determinando primero la forma correcta y después el interior.

Para los otros rompecabezas 3 x 3, indique sumar para # 54, restar para # 59, cambio de dos formas o propiedades para # 61, y multiplicación para # 64 en ésta manera:

"Éste rompecabezas es diferente. Trata de hallar la idea del rompecabezas, después escoge la respuesta o pedazo que completa la figura lo mejor posible."

Inicialmente, deje las respuestas cubiertas y deja al niño resolver los problemas como lo hizo con los diseños 2 x 2. Sin embargo, E debe poner mucha atención a la manera que el niño usa para hallar la solucion ya que muchos Ss dan énfasis a las respuestas en vez de los componentes del rompecabezas. Si S lo hace así, muéstrele que tiene que pensar en el problema (rompecabezas) y cubra las respuestas, diciendo, - "Cuando sepas cómo debe verse el pedazo que falta, quita el papel y muéstrame con el dedo la respuesta de aquí."

Si S contesta correctamente, pregúntele, - "¿Cómo sabías que era ésa?" Si S contesta incorrectamente, vea el adiestramiento más específico abajo.

--- Diseño 54 - "Este rompecabezas es diferente. Trata de conseguir la idea del rompecabezas, después escoge la respuesta que completa mejor la figura.

Si S contesta correctamente, pregúntele - "¿Cómo sabías que era ésa?"

--- Diseño 54 - Si S contesta incorrectamente, dígale, - "Podemos resolver éste rompecabezas como hicimos con los otros. Lo que pasa en la primera fila tiene que pasar también en la segunda y en la tercera filas. Mira la fila de arriba (mostrando la figura de arriba y a la izquierda)."

"¿Qué tenemos aquí? (S: una flor) y aquí? (la figura en el medio arriba). (S: una flor) y aquí (arriba a la derecha) (S: dos flores)." Enseñando la segunda fila, dígale, - "Recuerda, todo lo que pasa en la fila de arriba tiene que pasar en ésta fila tambien. ¿Qué tenemos aquí? (mostrando la figura de la izquierda) (S: una yema) y aquí (figura en el medio) (S: una yema) y aquí (la de la derecha) (S: dos yemas)."

Antes de pasar a la tercera fila dele un repaso de las primeras dos. (La primera) - "¿Qué pasó aquí?" S debe responder indicando de manera que se entiende que la tercera figura es la suma de las primeras dos. - "¿Qué pasó en la segunda fila?" S debe responder igual. - "Ahora, recuerda bien, todo que pasa en la primera fila también pasa en la segunda y tiene que pasar en la tercera. ¿Qué tiene que pasar aquí? (Mostrando la figura a la izquierda en la tercera fila.) ¿Qué es ésto? (S: una yema y una flor), y ésto (la figura en el medio) (S: una yema y una flor). ¿Y ésto tiene que ser qué? (S:) ¿Cómo sabías eso? (S tiene que explicar el proceso que lo llevó a esta conclusión.)

Si S no indica espontáneamente la figura correcta que falta, comience con la figura de arriba a la izquierda y dígale, - "Una flor y una flor te da cuántas flores? (S:). (diga la contestación si S no la da verbalmente.)

Enseñando la segunda fila, - "Ésta yema y ésta te dan dos yemas." Enseñando la tercera fila, - "Ésta flor y yema y ésta flor y yema te dan ______?" (dos flores y dos yemas).

"También podemos resolverlo por las columnas. Ésta flor y ésta yema te dan una flor y una yema. Ésta flor y ésta yema te dan una flor y una yema. Ésta flor y yema y ésta flor y yema te dan ______? (dos flores y dos yemas) Enséñame la contestación que completará el rompecabezas. Si S no puede hacerlo, digale, - "Enséñame la figura o el pedazo que tiene dos flores y dos yemas."

Si S contesta bien, pregúntele, - ¿Cómo sabías que era ésta?

Si S no puede hacerlo, enséñele la contestación correcta y digale, - "Ves, ésta tiene dos flores y dos yemas. Pase al próximo problema.

--- Diseño 57 - Repita el mismo proceso de 56 pero ahora dígale, - "Una persona con un brazo y una persona con un brazo te dan una personas con dos brazos, etc."

--- Diseño 55 -"Este rompecabezas tiene la misma idea. Cuando sabes la idea del rompecabezas escoge la respuesta de abajo que mejor lo completa."

Si S contesta correctamente, pregúntele, - "¿Cómo sabías que era esa?"

Si S responde incorrectamente, dígale, - "Podemos hacer éste rompecabezas como hicimos los otros. Todo lo que pasa en al primera fila tiene que pasar en la segunda y también en la tercera. Mira a la fila de arriba (mostrando la figura de arriba y a la izquierda). "¿Qué se ve diferente en cada casa? (Si S dice, - "Todas son casas, o está confundido") pregúntele, - "¿Son ésta casa (izquierda arriba) y ésta casa (la del medio) exactamente iguales?" Si no responde, pregúntele lo mismo de la segunda y tercera casas. "¿Qué es diferente? Bien. Ésta casa tiene dos ventanas (la tercera) y ésta (la segunda) tiene una. Hay otras diferencias entre las casas? No, bien. La unica diferencia es las ventanas."

"¿En qué es diferente la segunda casa de la primera?"(izquierda arriba). Si no responde, pregúntele, - "¿Cuántas ventanas hay en ésta casa (primera)? y en ésta (segunda)? Bien. Ambas tienen una sola ventana." Muéstrele la tercera y dígale, - "Decimos que hay dos ventanas en ésta casa. ¿Ésta está en el piso alto y ésta está en __________? (el bajo). Bien. Miramos a ésta casa (primera). ¿Es ésta una ventana alta o baja? Bien. Entonces la diferencia entre las casas es que las ventanas están en diferente pisos. Ésta casa (primera) tiene una ventana en el piso alto, ésta casa tiene una ventana en el piso bajo, y la tercera casa tiene una ventana alta y otra baja. Es como si tomamos ésta casa (primera) y la ponemos encima de la segunda para hacer la tercera.

Mostrando la segunda fila.

"¿Qué se ve diferente entre las casas en ésta fila? Recuerda, todo lo que pasa en la primera fila tiene que pasar en ésta también." Si S no contesta, repita el proceso de arriba.

Antes de pasar a la tercera fila, E dele un repaso de las dos filas. (Mostrando la primera fila.) - "¿Qué pasó en ésta fila?" S debe contestar indicando en una manera que se entienda bien que la tercera figura es la que resulta de juntar las dos anteriores. - "¿Qué pasó en la segunda fila?" S debe contestar en la misma manera. "Ahora recuerda bien, todo que pasa en la primera fila tiene que pasar en la segunda y tiene que pasar en la tercera. ¿Qué tiene que pasar en ésta fila? Si S contesta correctamente, felicítelo y pase al próximo problema. Si S no responde o contesta incorrectamente, dígale la contestación correcta y explíquele porqué es correcta, - "Ésta casa tiene dos ventanas en el piso alto; ésta tiene dos ventanas en el piso bajo; entonces ésta casa puesta encima de ésta debe hacer una casa con dos ventanas altas y dos bajas.

También puede enseñar al niño que el problema puede ser resuelto por las columnas, empezando por la columna izquierda. Si S no puede hacerlo, enséñele la contestación correcta, diciendo, - "Mira, ésta tiene dos ventanas alta y dos bajas." Pase al próximo problema.

Restar

--- Diseño 59 - "Éste rompecabezas tiene una idea diferente. Trata de coger la idea del rompecabezas depués busca la respuesta que completa la figura lo mejor posible." Si S contesta correctamente, pregúntele, - "¿Cómo sabías que era esa?"

Si S da la contestación incorrecta o parece que no la sabe o dice "No" dígale, - "Vamos a hacerlo juntos. Podemos resolver éste rompecabezas como hicimos con los otros. (Mostrando las filas.) Todo lo que pasa en la primera fila tiene que pasar en la segunda y otra vez en la tercera. Mira la primera fila. ¿Qué es diferente entre éste árbol (arriba a la izquierda), éste árbol (el medio) y éste árbol (arriba a la derecha)? (S: Cada uno pierde una hoja o algo parecido.) Mira la segunda fila. (Repita las preguntas mostrando cada figura.) Mira la tercera fila. ¿Cómo debe verse éste árbol? ¿Cómo sabías que tenía que verse como éste?"

Enséñele que también puede resolver el problema por columnas, empezando con la columna de la izquierda.

Si S no lo entiende, comenzando con la figura de arriba a la izquierda, dígale, - "¿Qué se ve diferente en cada árbol? Bien, el número o la cantidad de hojas en cada árbol es diferente." Si S no dice espontaneamente 'la cantidad de hojas'; pregúntele, - "¿Cuántas hojas hay en cada árbol? Muy bien, hay cuatro hojas en éste árbol (primero), tres en éste (muéstrele el segundo) y dos en éste (tercero)."

"Vamos a mirarlos más cuidadosamente. Éste árbol tiene cuatro hojas, (el árbol de arriba a la izquierda), éste tiene tres hojas (él del medio). ¿Cuanto es la diferencia entre cuatro y tres? Correcta. Uno. Entonces éste árbol (segundo) tiene tres hojas y éste (tercero) tiene dos. ¿Cuánto es la diferencia entre tres y dos? Bien, uno. Entonces cuando vamos del primer árbol al segundo perdemos una hoja, y cuando vamos del segundo árbol al tercero perdemos otra hoja. Cada vez que pasamos de un arbol al otro perdemos una hoja. Haga lo mismo con la segunda fila, excepto deje a S explicar lo que pasa, si puede. (Tercera fila) Ahora mira la fila entera y recuerda que todo lo que pasa en la primera fila tiene que pasar en la segunda y también tiene que pasar en la tercera. ¿Qué debe estar aquí?" (Muéstrele el espacio vacío.) Si S no sabe la contestación siga a la tercera fila, enseñándole que cada árbol pierda una hoja hasta (que) el espacio queda vacío. Vea si S sabe ahora la contestación.

También, enséñele que puede resolver el rompecabezas por las columnas, empezando con la columna izquierda, comparando la primera figura con la segunda, etc.

Si S todavía no sabe la contestación, dígale, y explique porqué. Muestra cada par de árboles, empezando con el árbol de arriba a la izquierda y a lo largo de la fila. Deje a S contar las hojas en cada figura: 4-3-2, 3-2-1, 2-1- y 0. Ahora dígale que le enseñe a Ud. con el dedo la contestación. Después de ésto pase al próximo diseño.

--- Diseño 61 - "Éste rompecabezas tiene la misma idea de la anterior." Repita el proceso del # 59, sustituyendo la palabra 'flor' por 'hoja'.

--- Diseño 60 - "¿Qué pedazo o figura debe estar aquí?" El adiestramiento es igual al del # 59.

Cambio de dos propiedades

--- Diseño 62 - "Éste rompecabezas tiene una idea diferente. ¿Qué piensas tú que debe estar aquí?" Si S contesta correctamente, pregúntele, - "¿Cómo sabías que ésa debe estar en éste espacio?" Espere una contestación. Si S le dice correctamente porqué, pase al próximo diseño.

Si S no puede explicar la contestación o no la sabe, déle la siguiente explicación. Recuerda que en los otros rompecabezas, todo que pasa en la primera fila tiene que pasar en la segunda y también en la tercera. Muéstrele el triángulo en la primera fila, a la izquierda. "¿Qué tiene éste triángulo por dentro? (nada) ¿Y éste? (triángulo segundo) (S: tiene rayas hasta la mitad) ¿Y éste?" (tiene rayas por todo, está todo rayado, etc.).

"¿Entonces, qué cambia en los triángulos cuando vas desde aquí (izquierda arriba) a aquí (medio) a aquí (derecha arriba)? (S: los triángulos se llenan con rayas) Bién, los triángulos se van llenando con rayas de éste a éste, a éste."

"Ahora, mira la segunda fila, y recuerda que todo lo que pasa en la primera fila también va a pasar en la segunda." Muéstrele el primer triángulo en la segunda fila y pregúntele, - "¿Qué cambia de éste triángulo a éste (el medio)? Éste (a la izquierda) está a medio llenar con una raya en zig-zag y no tiene rayas verticales. Éste (segundo) y éste (tercero) también están a medio llenar con una raya en zig-zag y diagonales. (Enséñele que ésta fila es similar a la primera fila excepto que la primera no tiene rayas en zig-zag en diagonales en ninguna de los tres dibujos.)

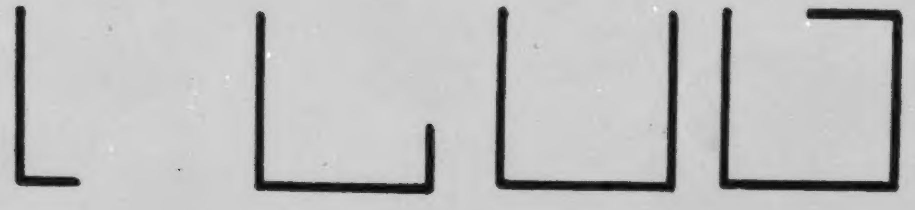
"Ahora, miren la tercera fila. Éste triángulo (izquierda) esta lleno con líneas en zig-zag, y también el del medio. ¿Cómo debe verse éste? (S: lleno con rayas en zig-zag.) ¿Qué pasa con las rayas verticales (que van de arriba a abajo)? No hay ninguna en éste triángulo (tercera fila a la izquierda), el triángulo del medio está a medio llenar. ¿Y éste, cómo debe verse? (muestre el espacio vacío). Recuerde, todo lo que cambia en la primera fila tiene también que cambiar en la segunda, y también en la tercera."

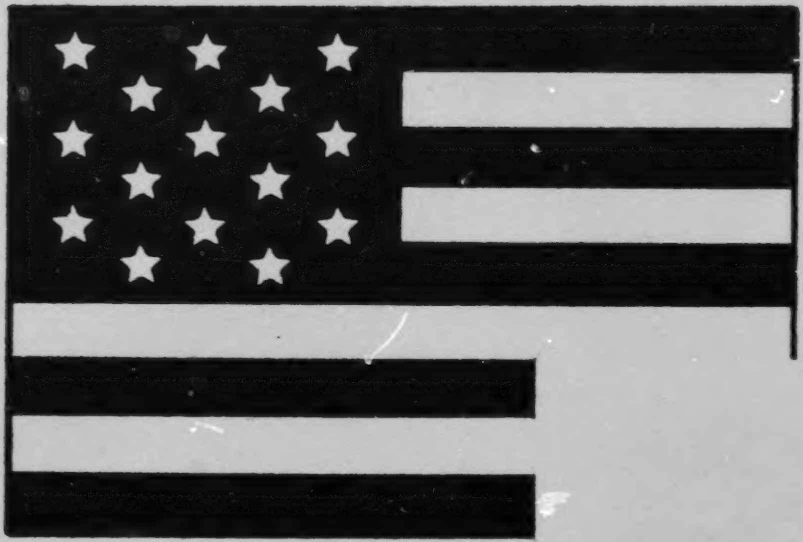
Si S no entiende, explíquele otra vez, terminando con: "Tiene que ser éste, porque está lleno con rayas en zig-zag y rayas verticales de arribahacia abajo." También, enséñele que puede resolver el problema columna por columna.

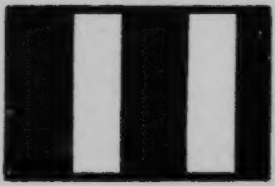
--- Diseño 63 -"Esta rompecabezas tiene la misma idea del otro." Dele las instrucciones del # 62.

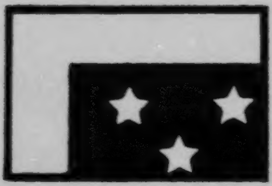
--- Diseño 65 - "Éste rompecabezas es diferente." Estos diseños solo deben usarse con niños mayores. Enséñele que la segunda figura de cada fila es dos veces más grande que la primera, y la tercera es tres veces más grande que la primera.

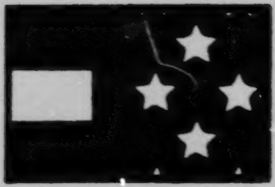
--- Diseños 66 & 67 - Pregunte a S cuál es el pedazo (contestación) que debe estar en el espacio vacío. Si es necesario, refiérase al diseño 26.

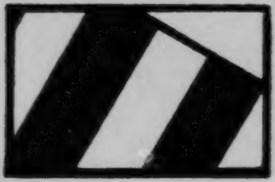


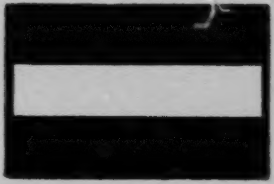


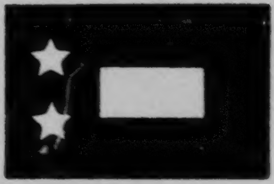


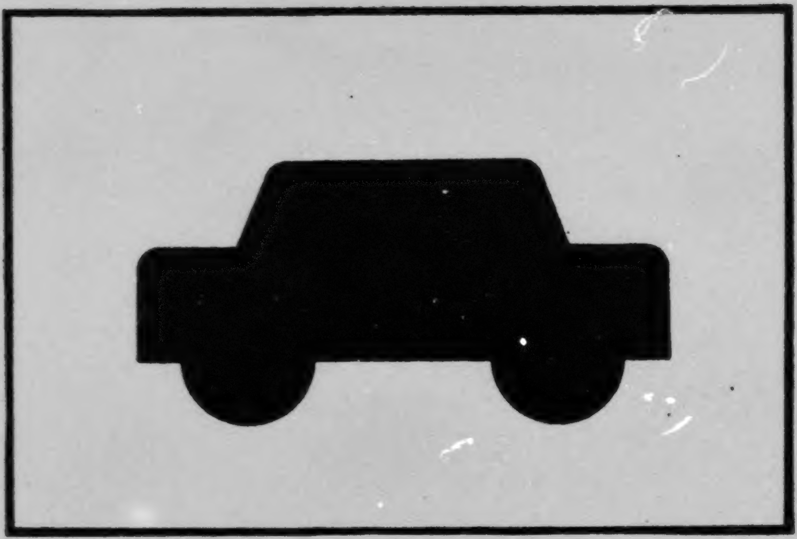


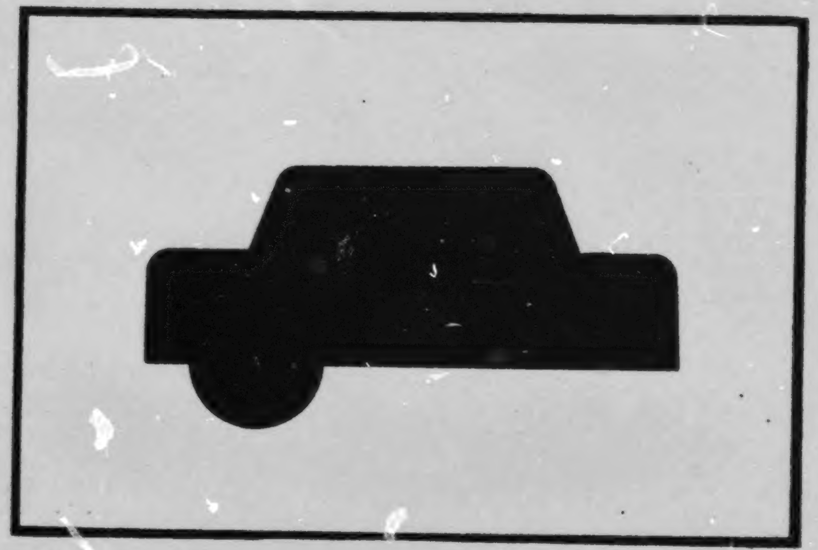


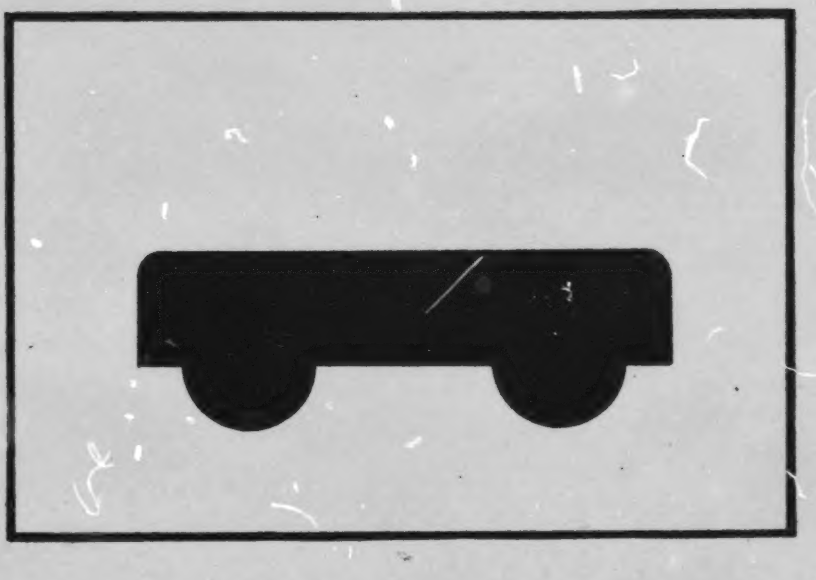












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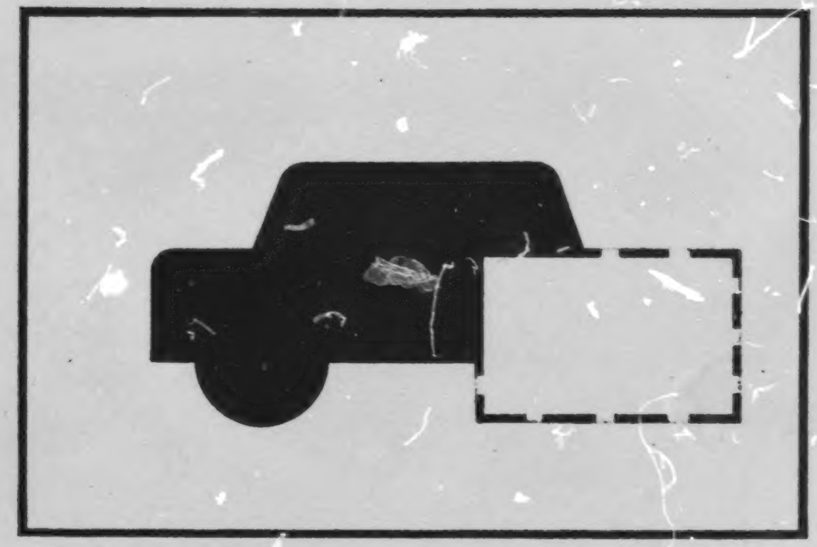

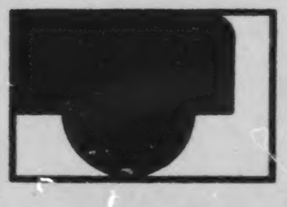

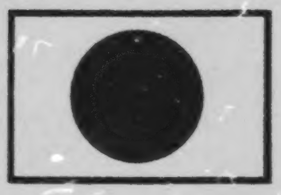

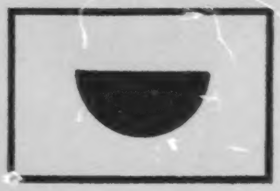

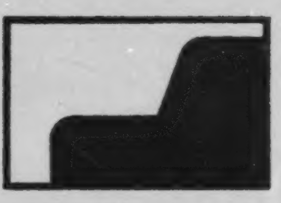

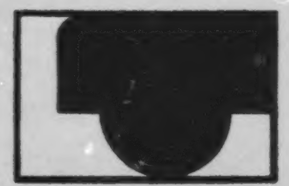

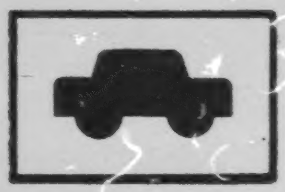

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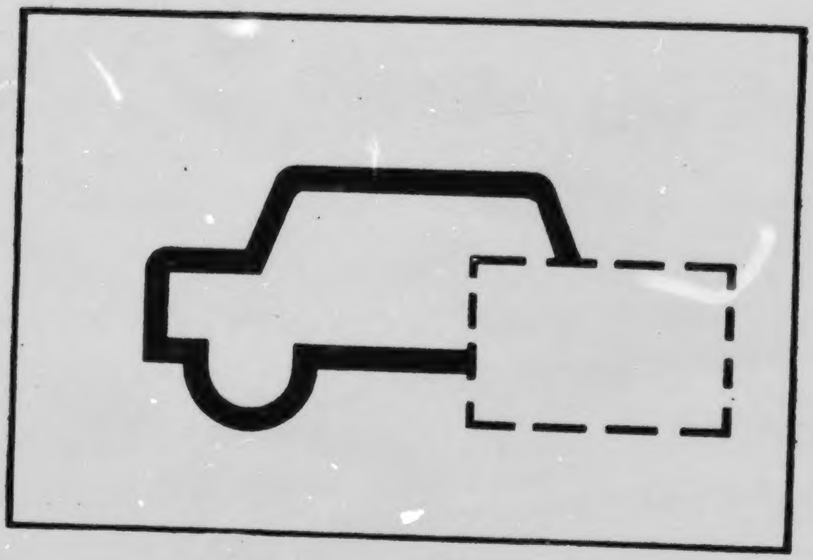

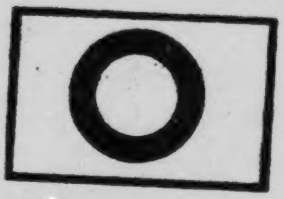

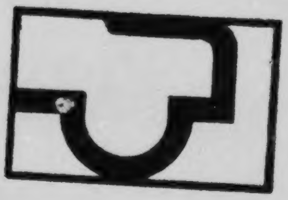

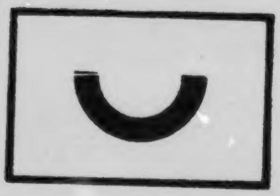

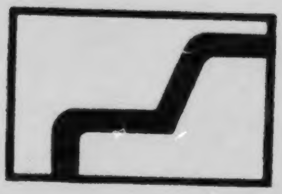

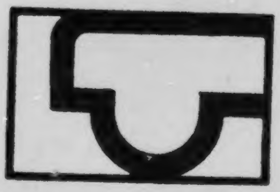

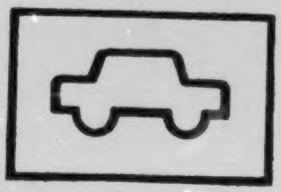

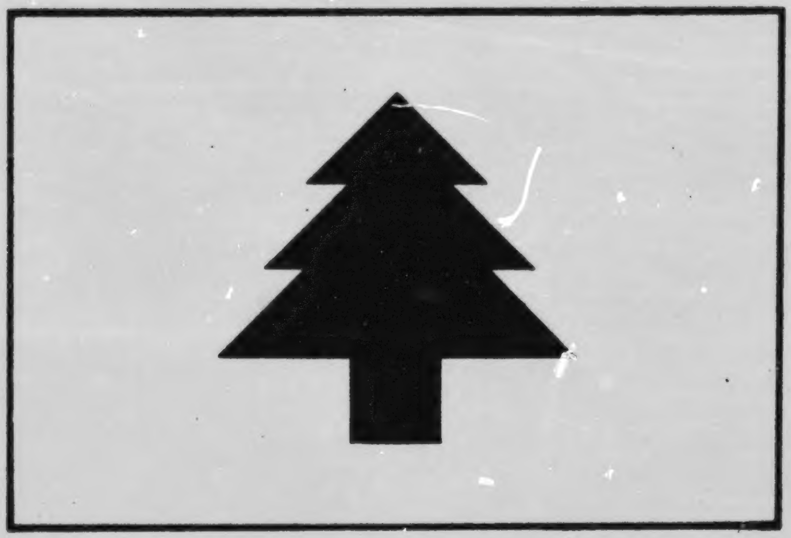

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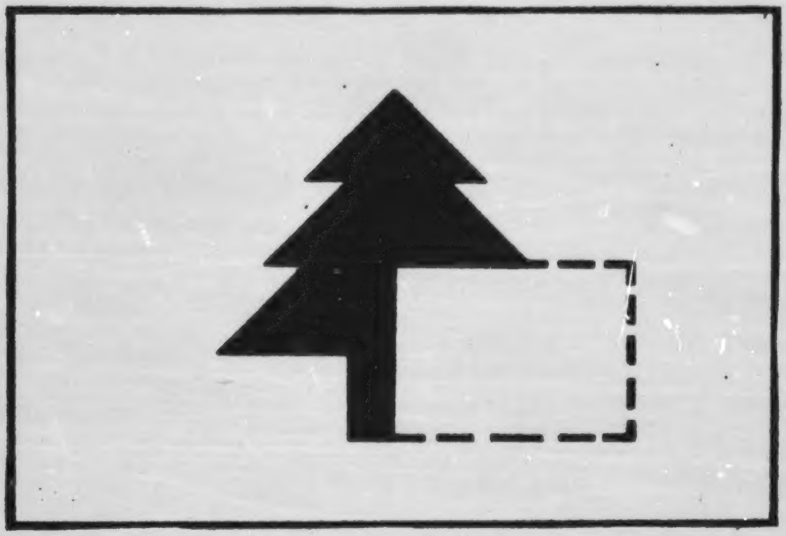

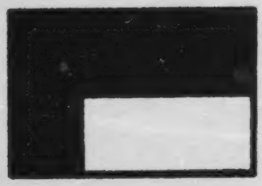

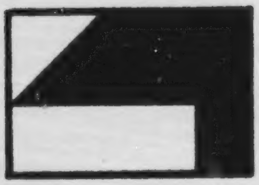

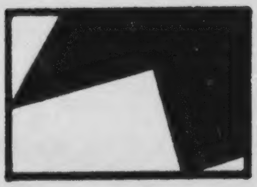

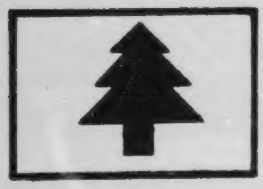

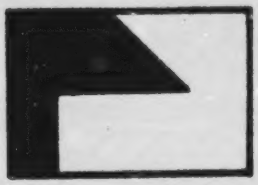

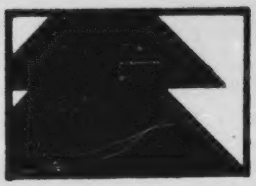

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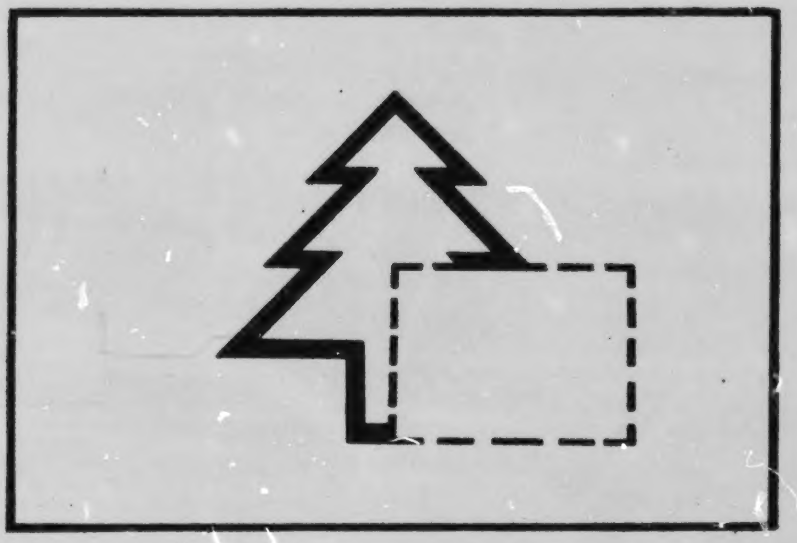
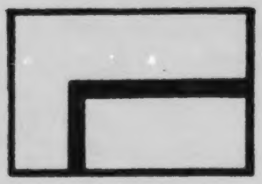
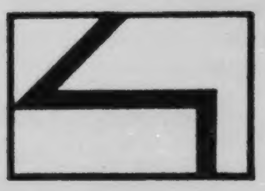
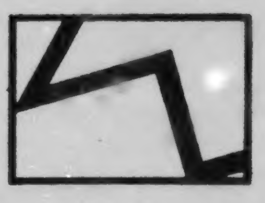
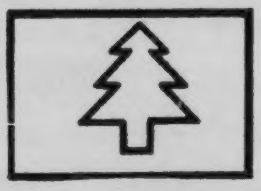
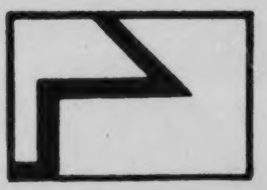
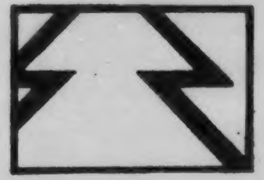
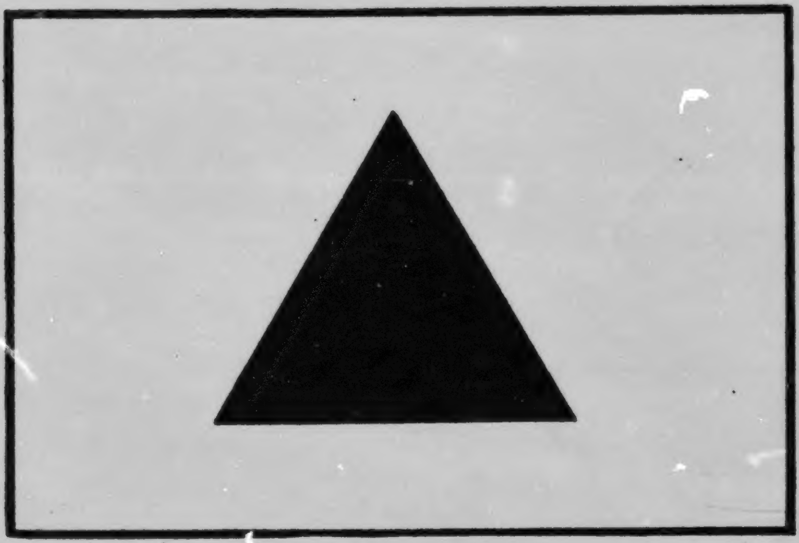


12



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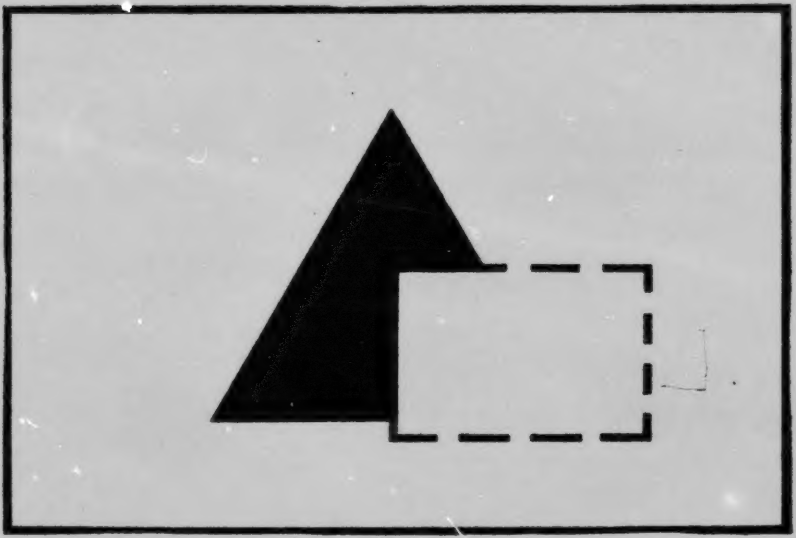

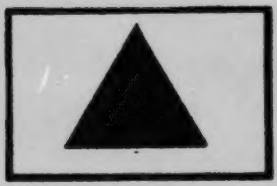

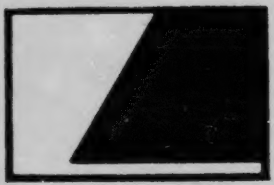

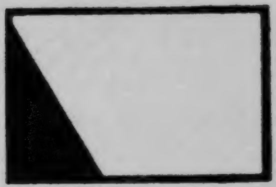

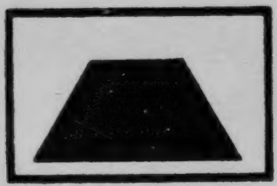

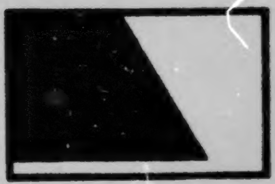

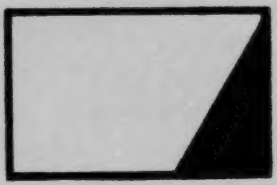

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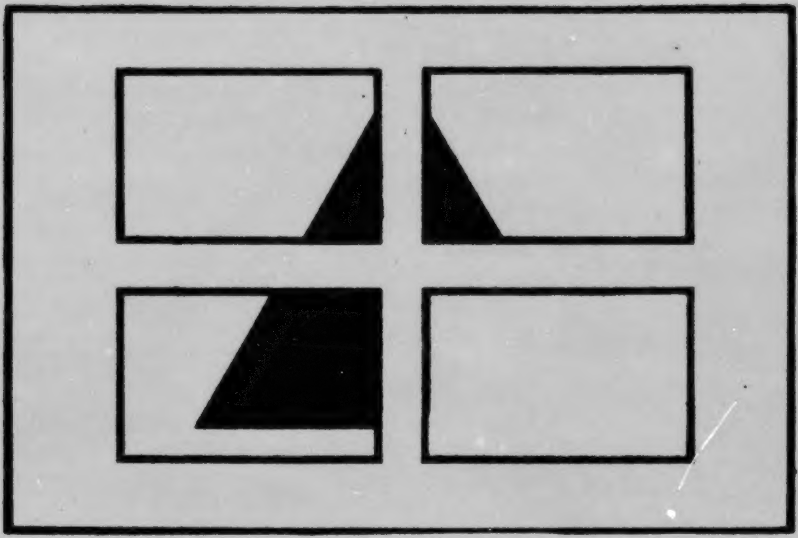

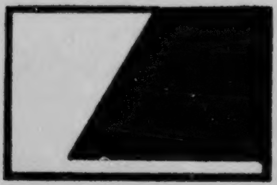

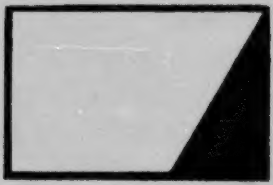

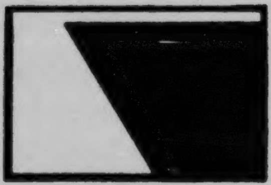

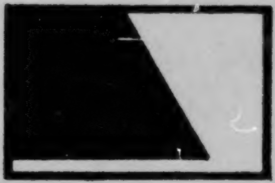

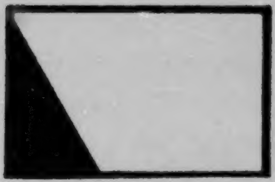

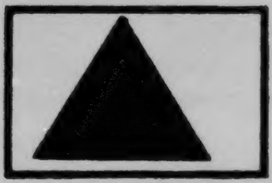

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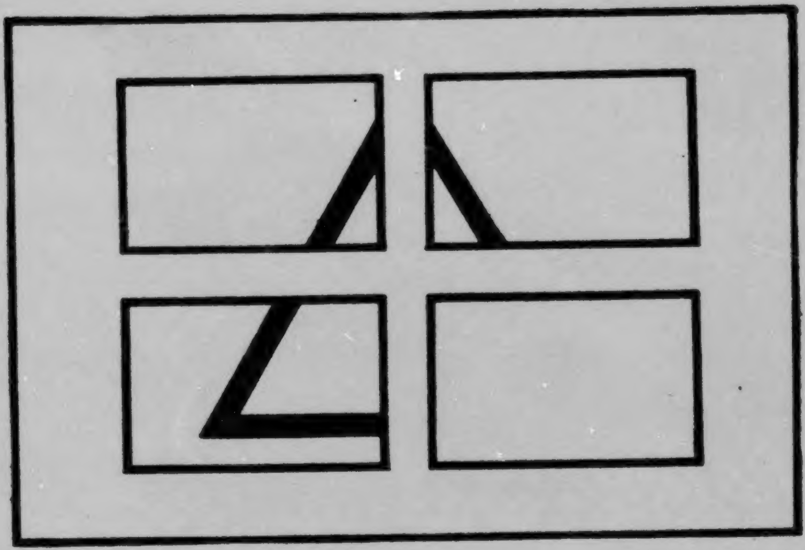
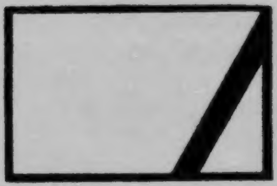
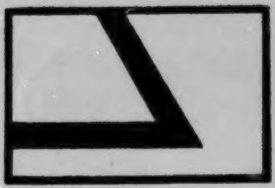
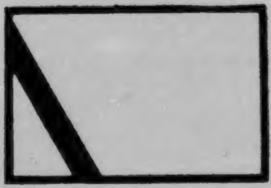
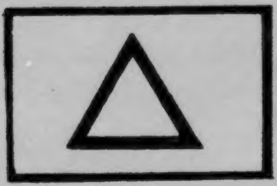
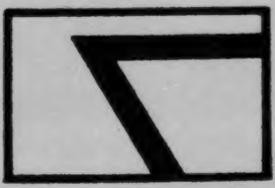


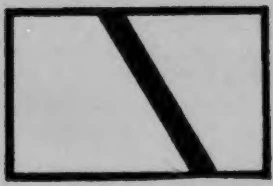




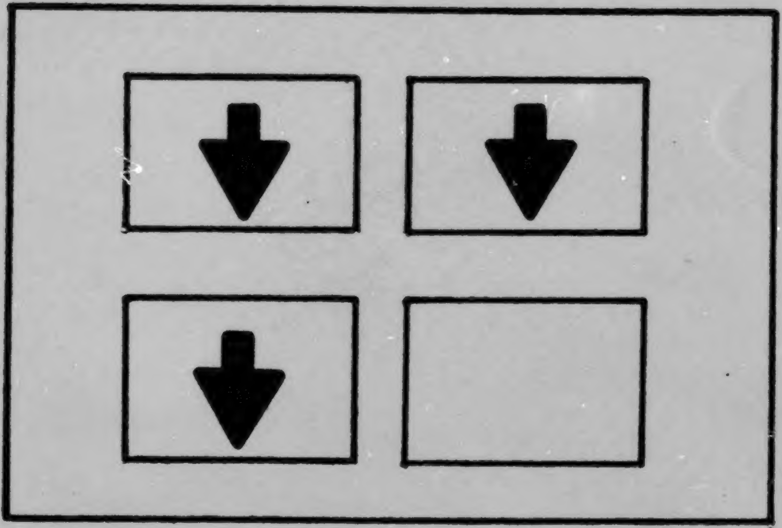


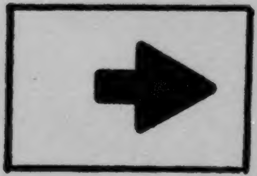


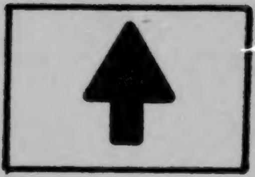


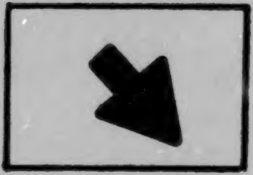


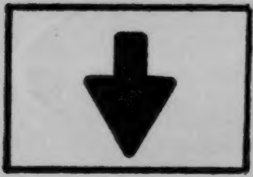
16

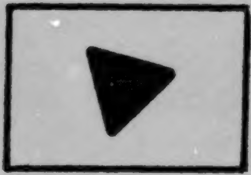


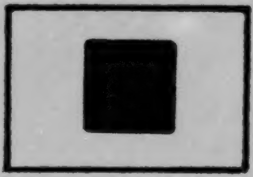












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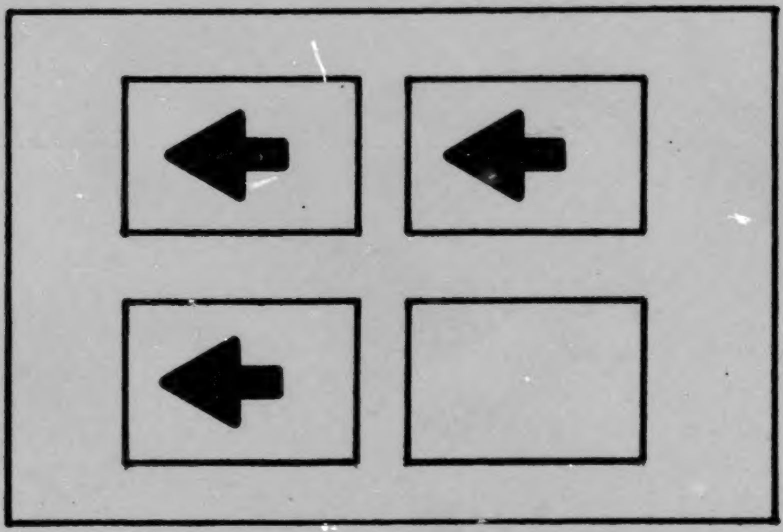

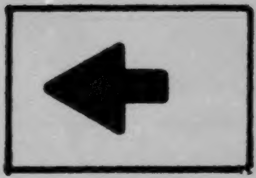

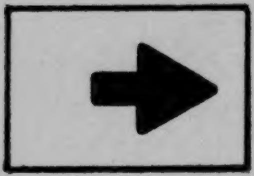

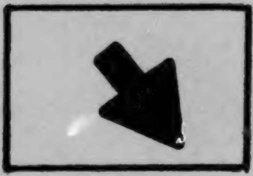

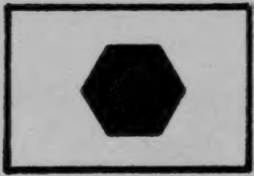

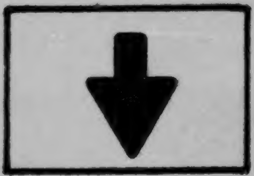

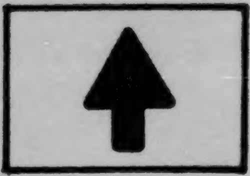

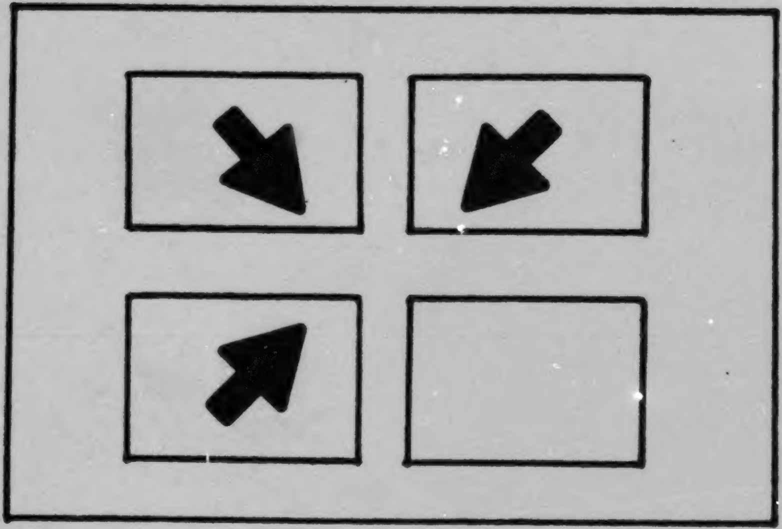

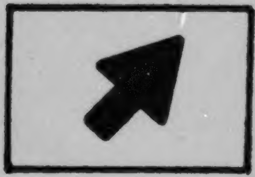

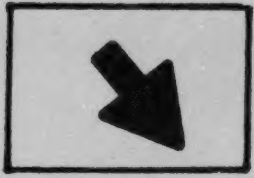

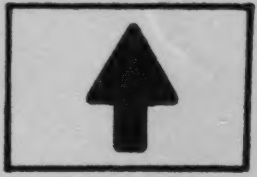

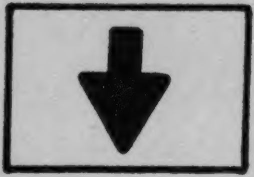

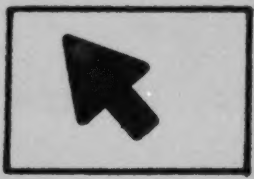

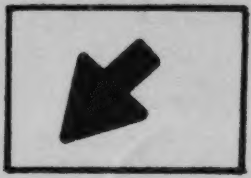

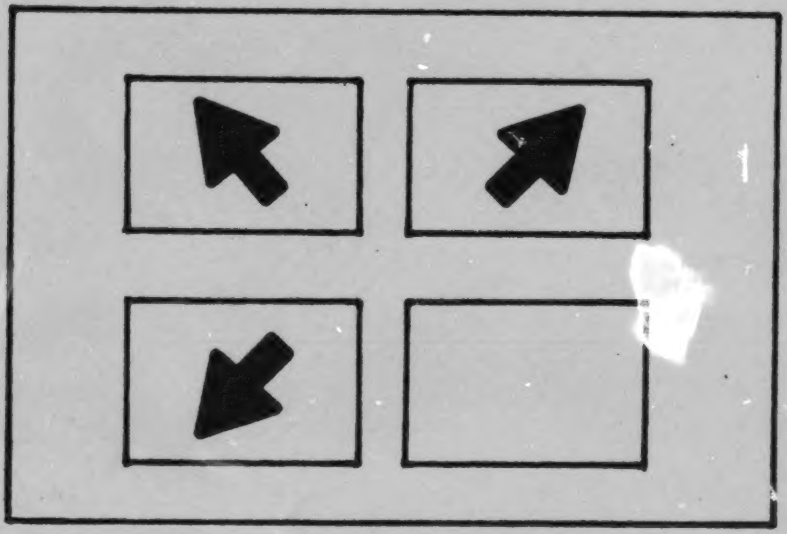

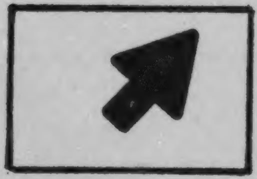

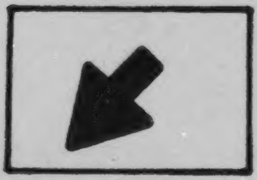

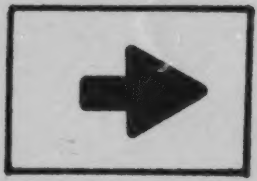

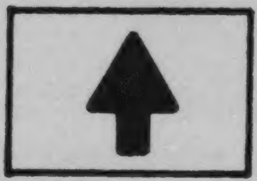

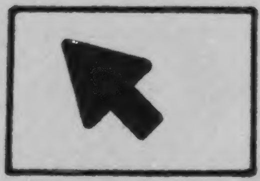

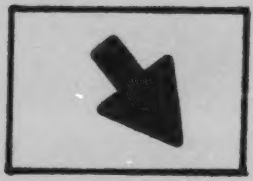

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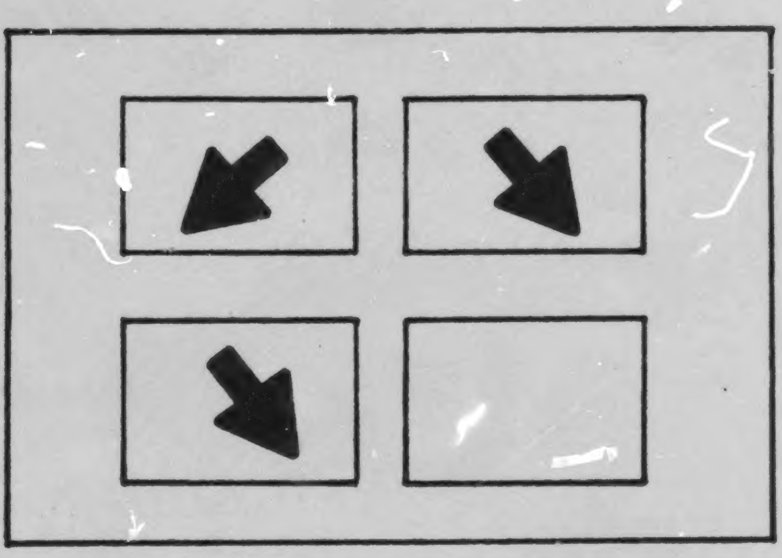

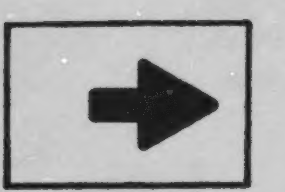

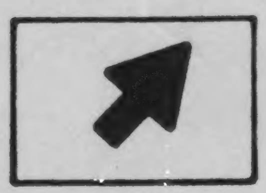

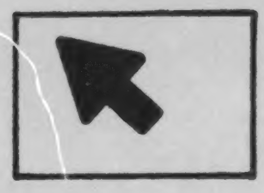

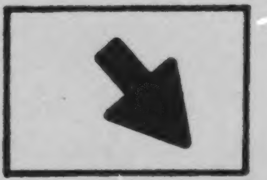

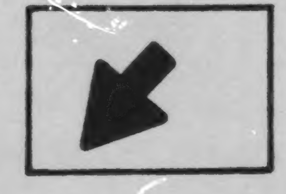

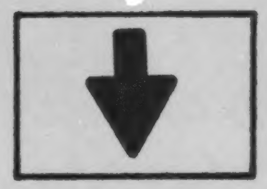

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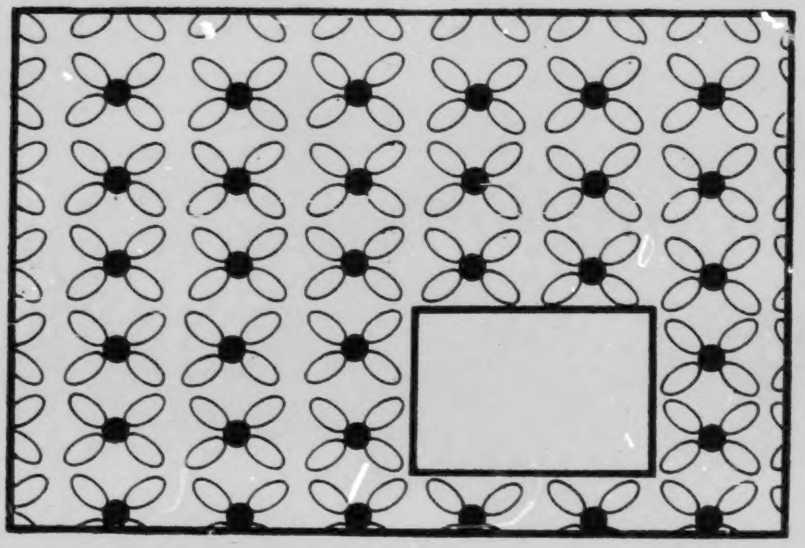

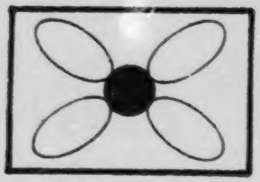

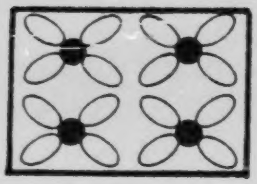

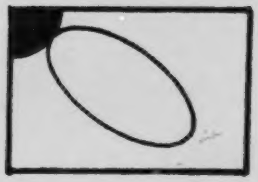

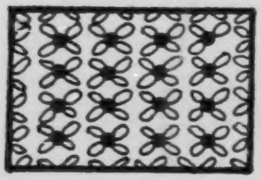

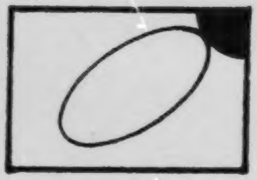

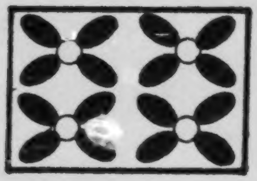

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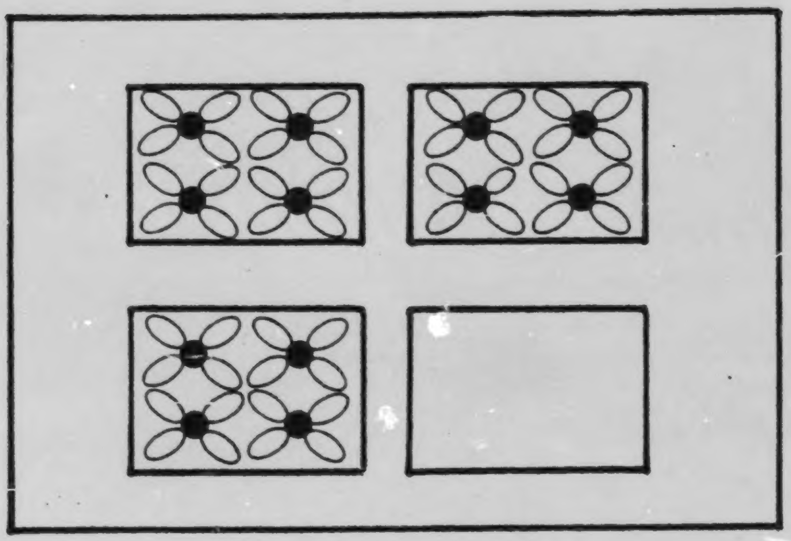

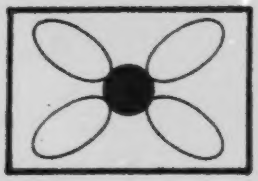

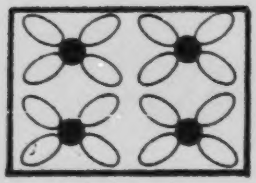

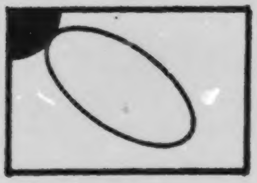

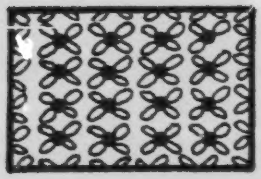

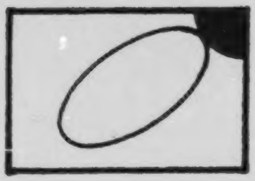

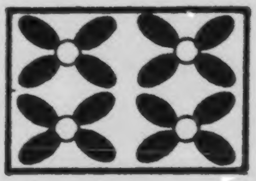

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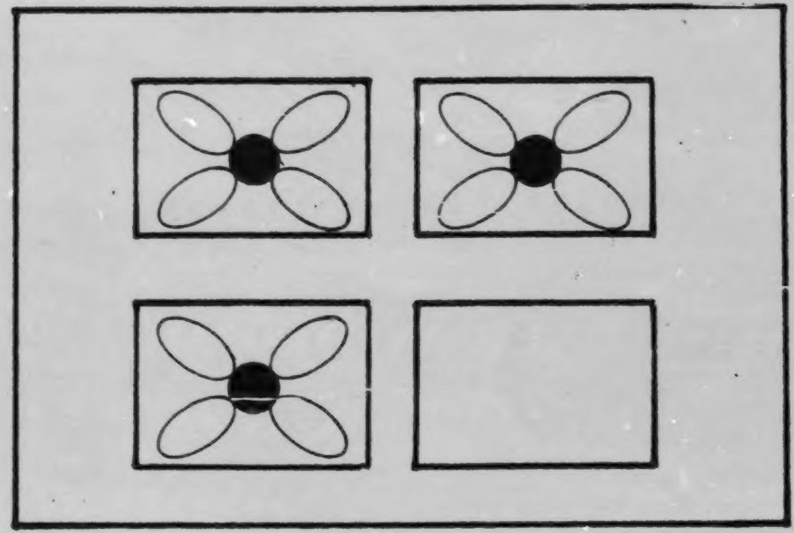

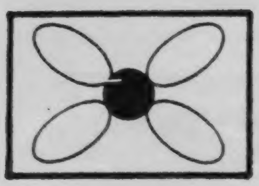

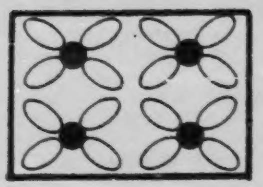

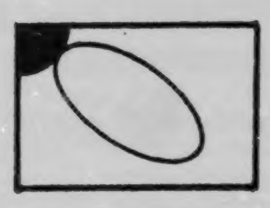

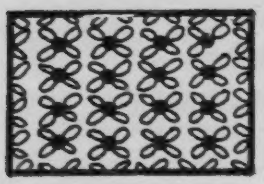

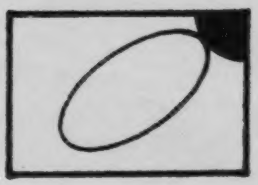

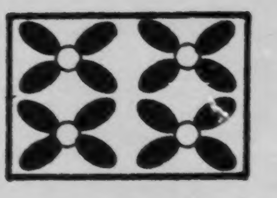

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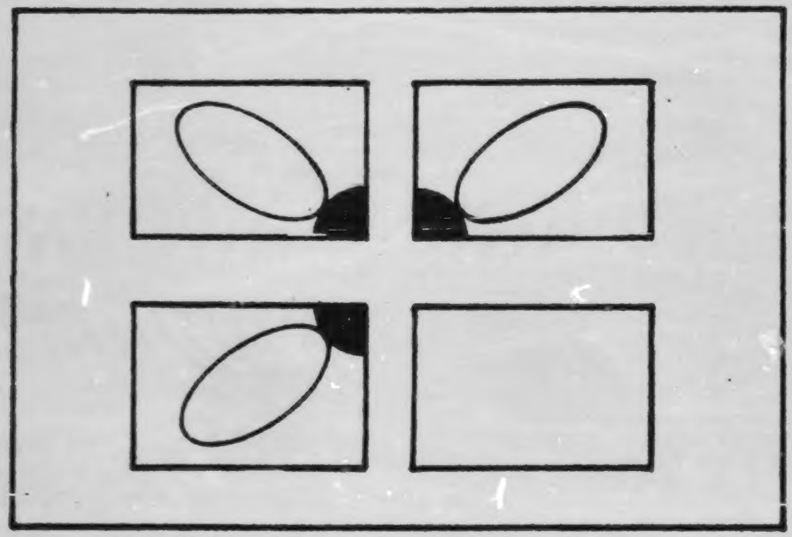

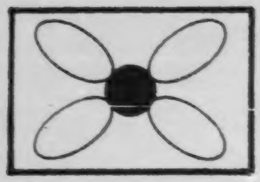

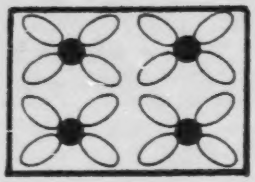

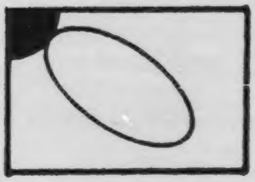

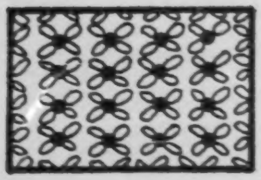

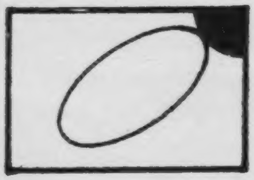

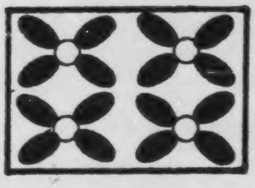

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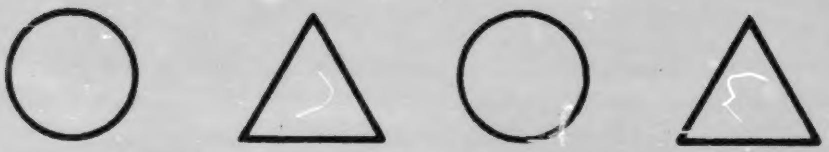

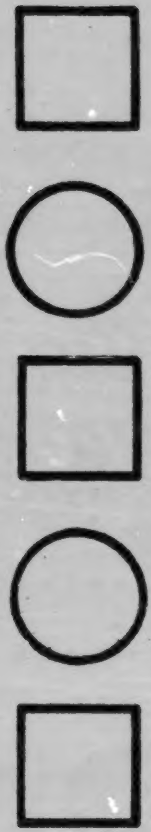

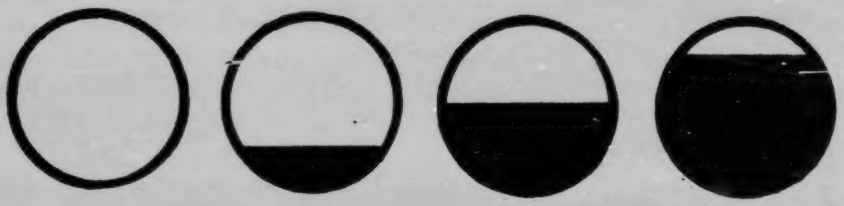

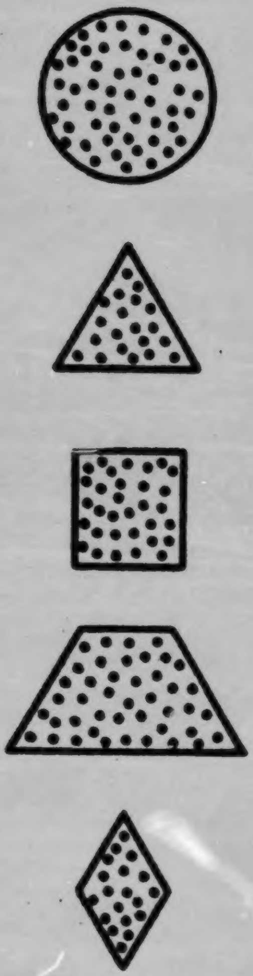

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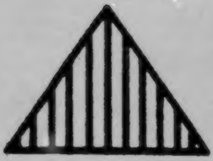
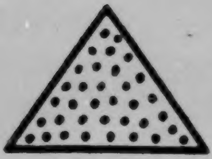
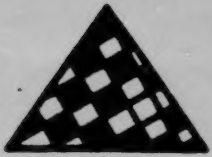
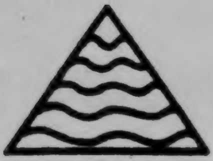
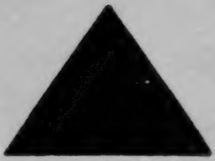
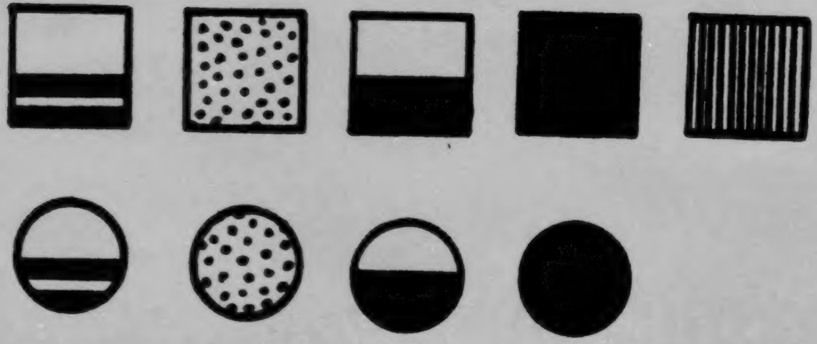


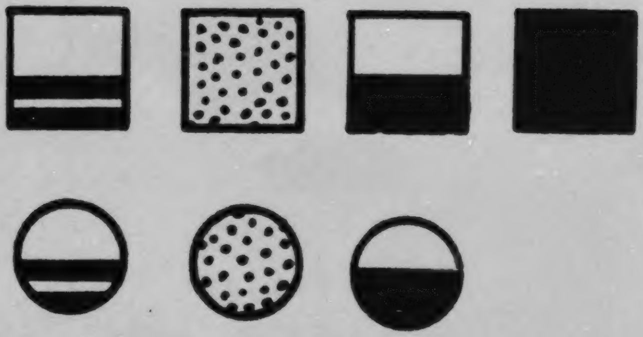


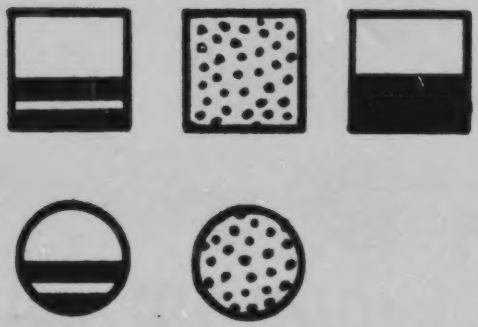


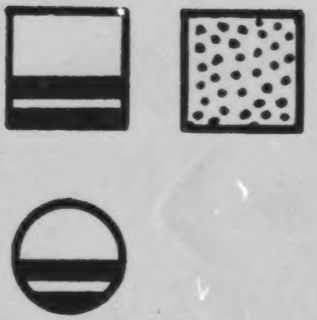


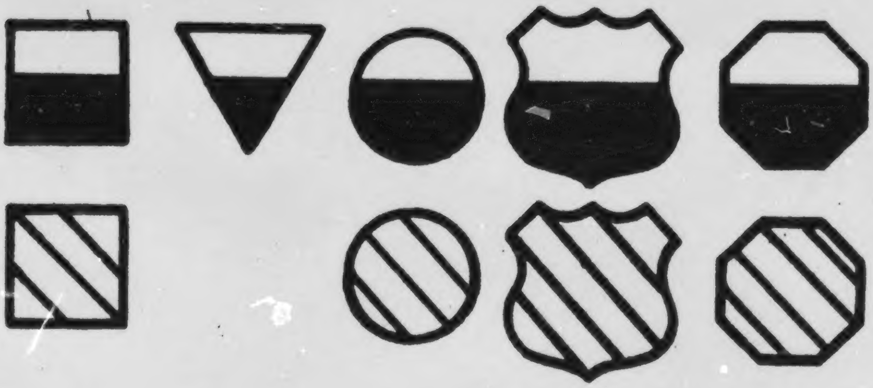


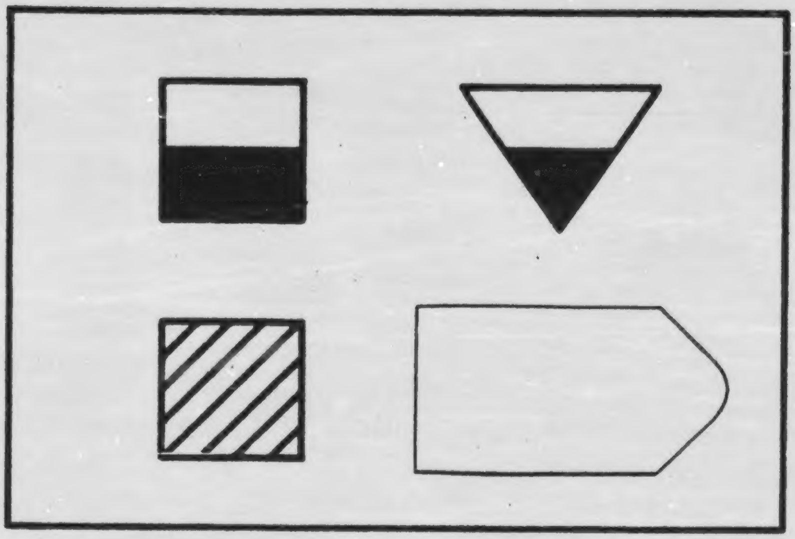




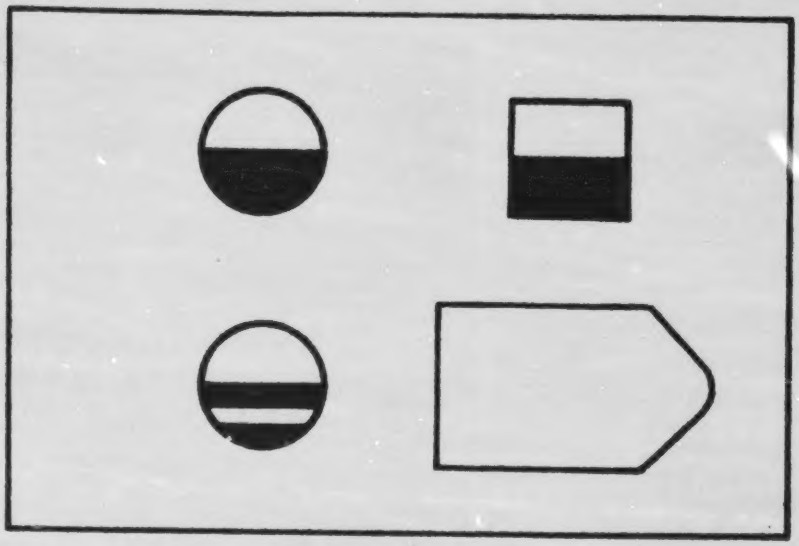


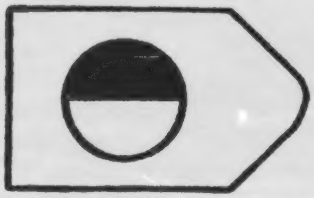


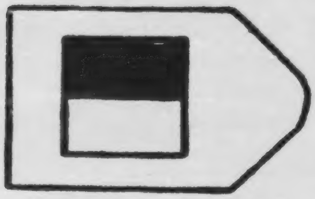


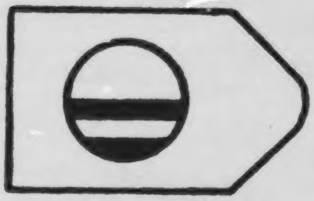


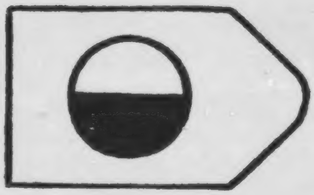
37

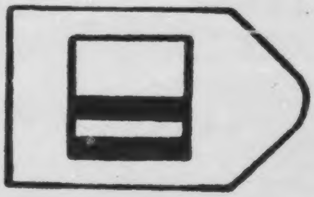


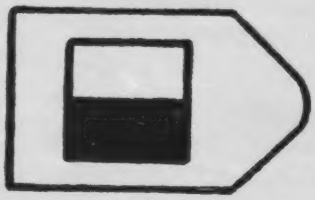












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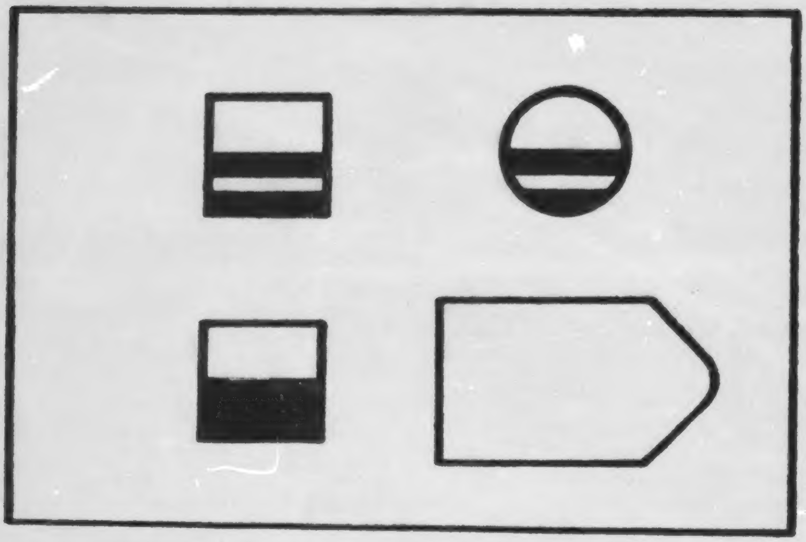

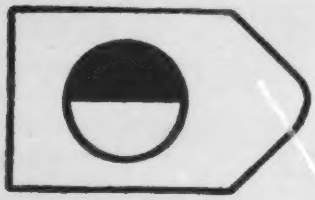

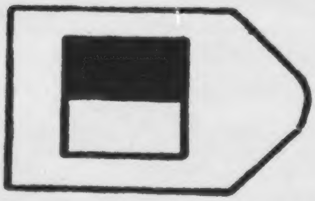

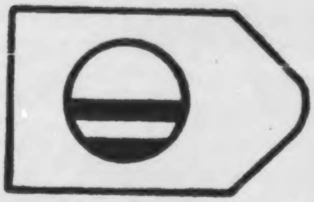

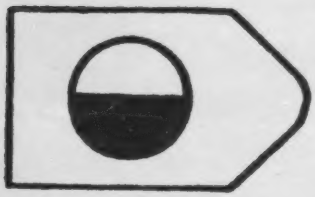

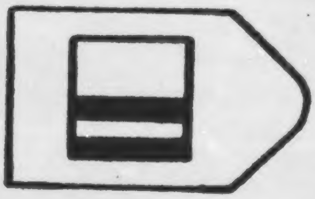

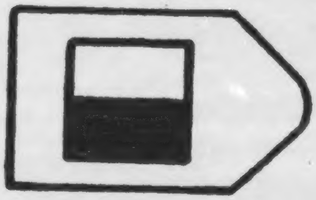

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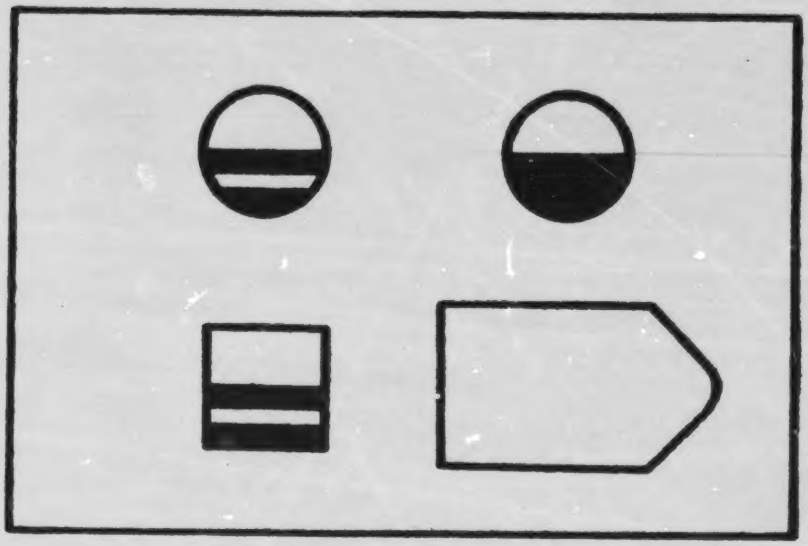

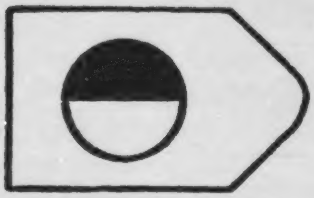

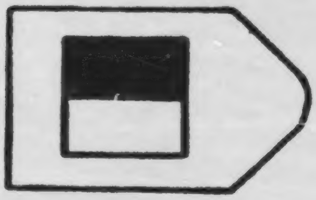

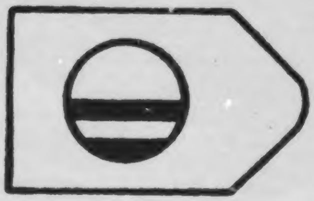

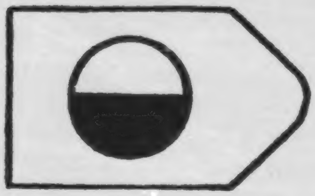

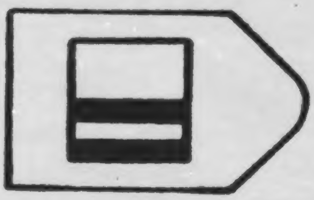

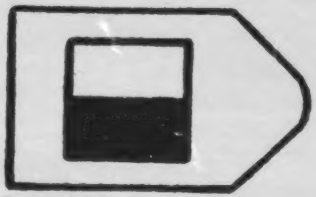

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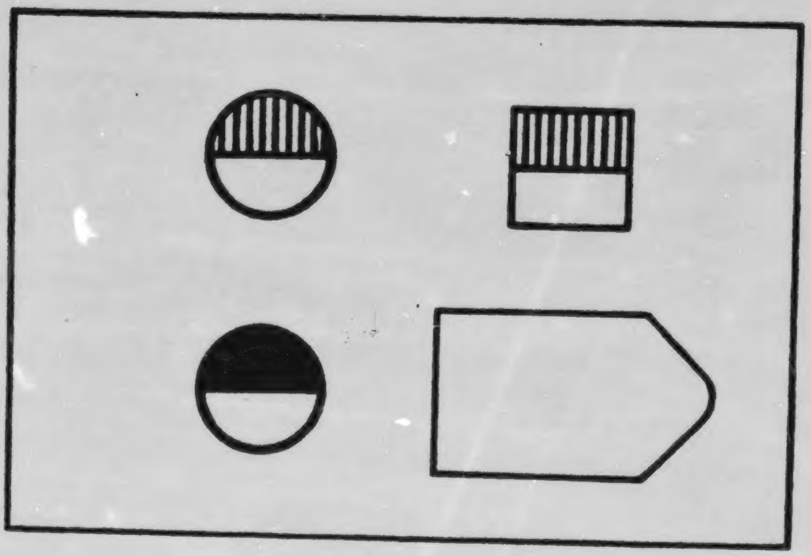
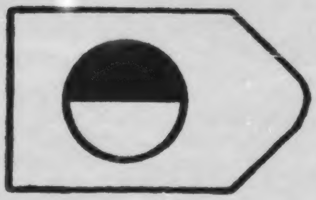
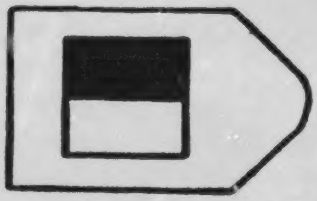
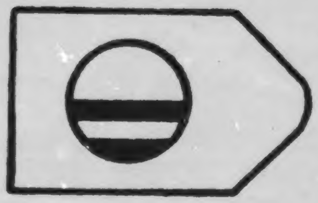
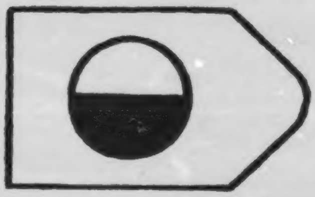
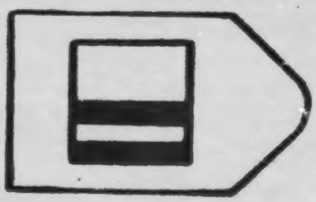


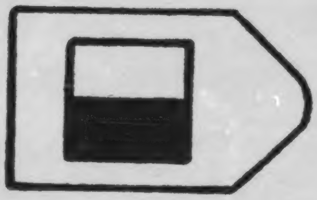




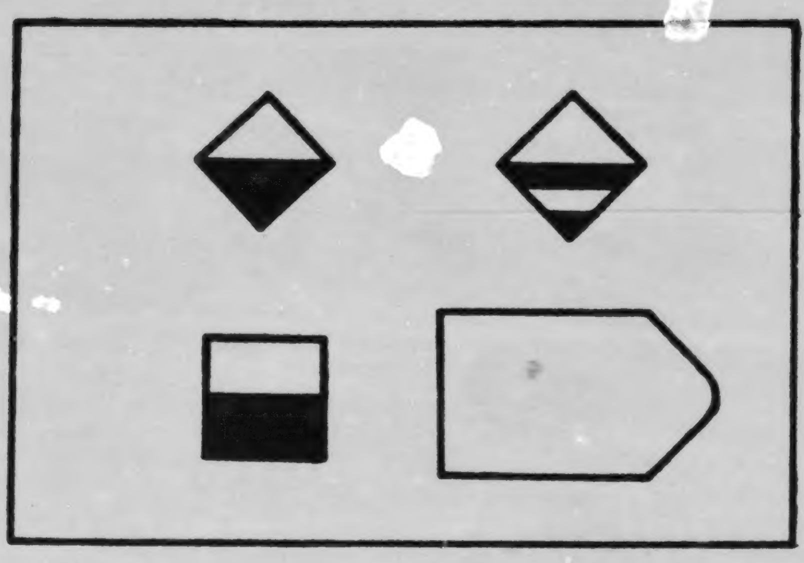


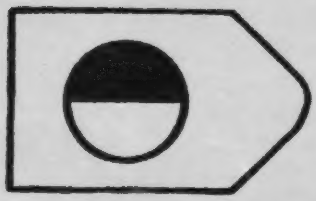


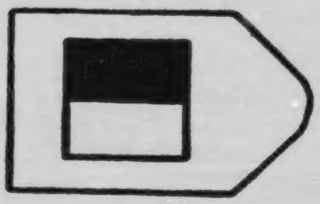


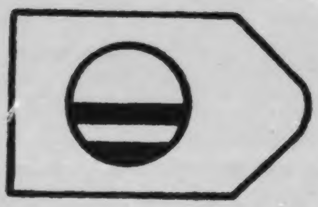


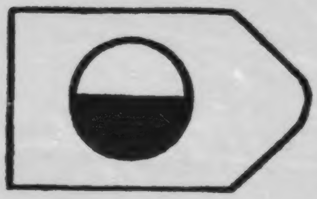
41

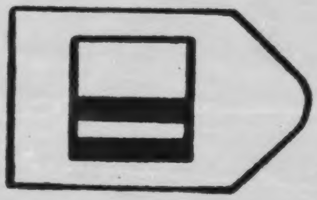


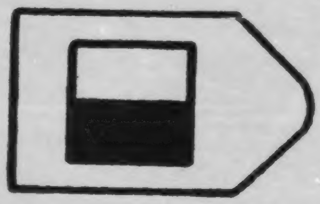












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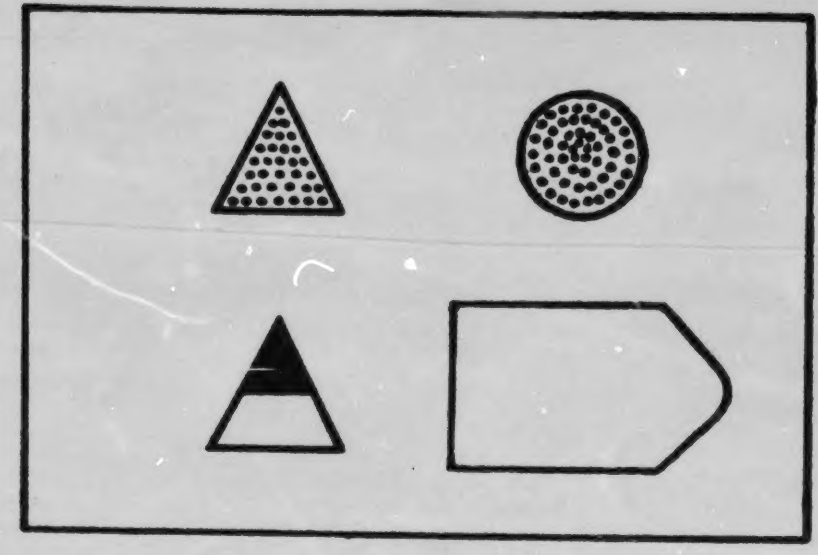
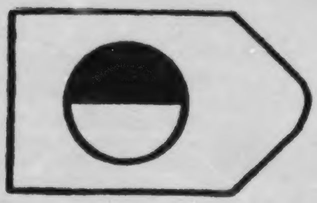
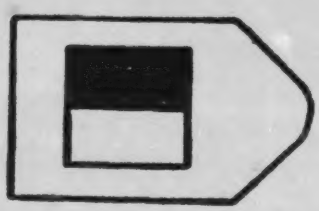
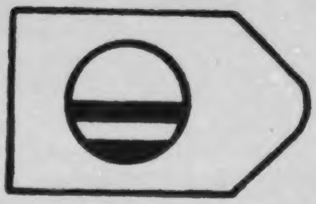
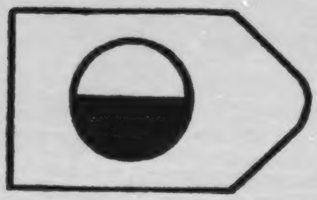
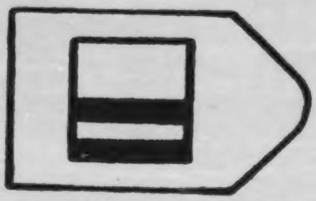


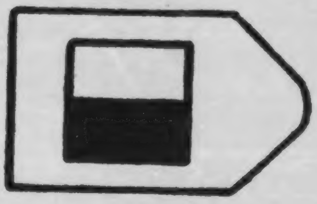




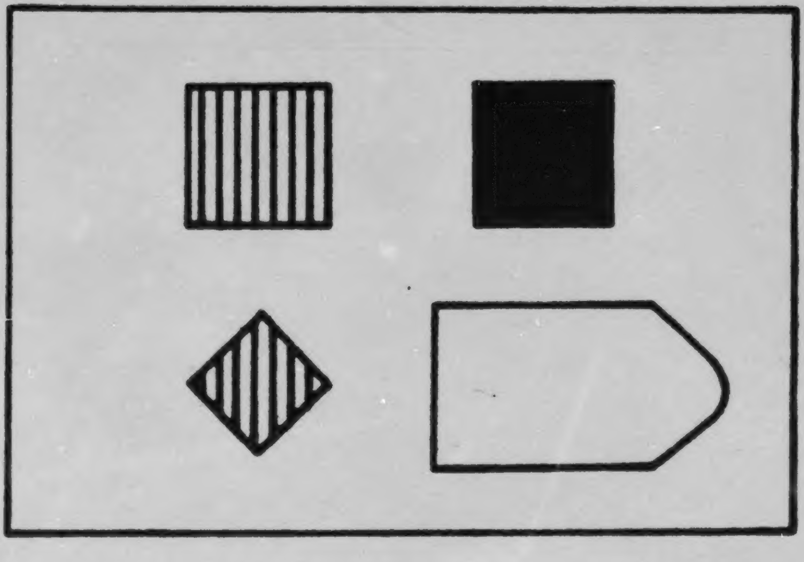


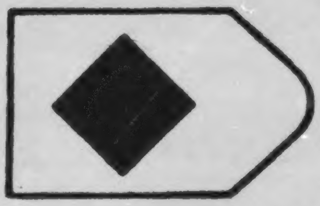


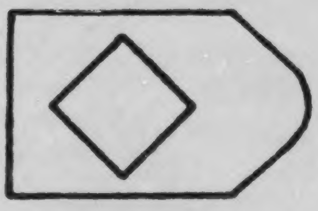


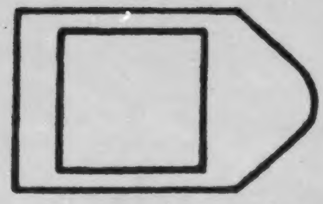


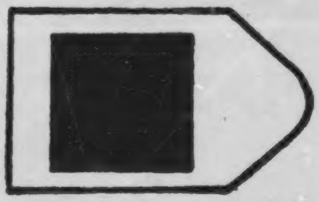
43

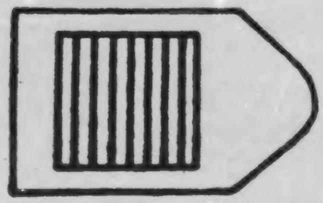


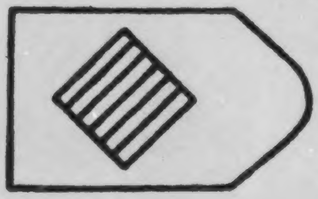












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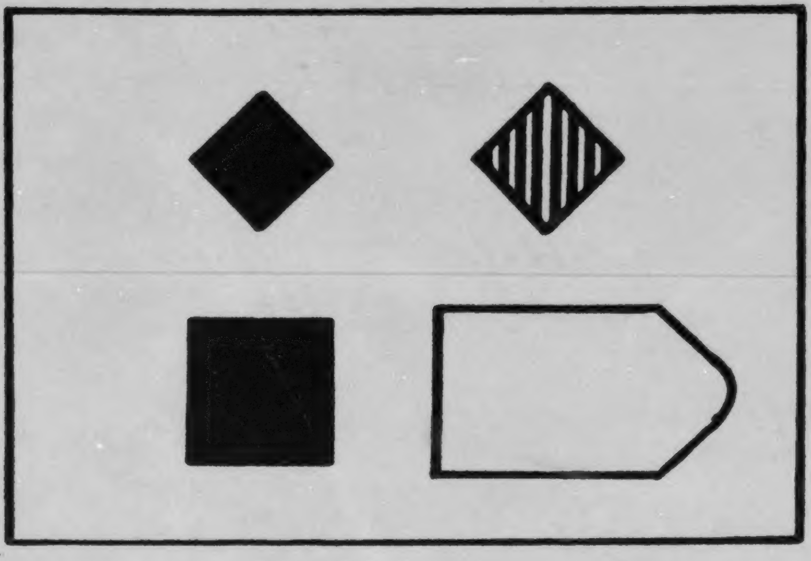
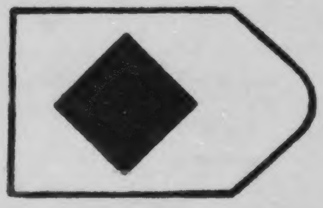
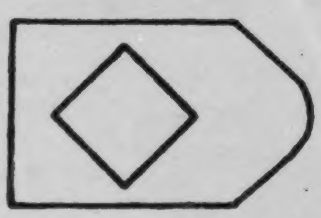
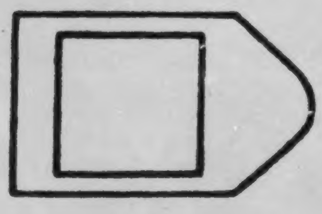
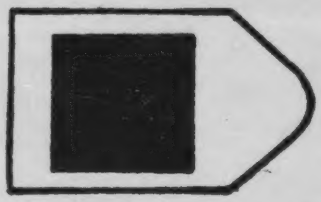
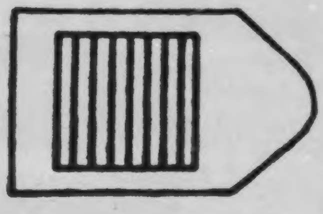


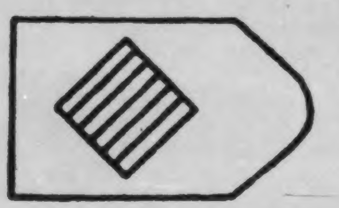




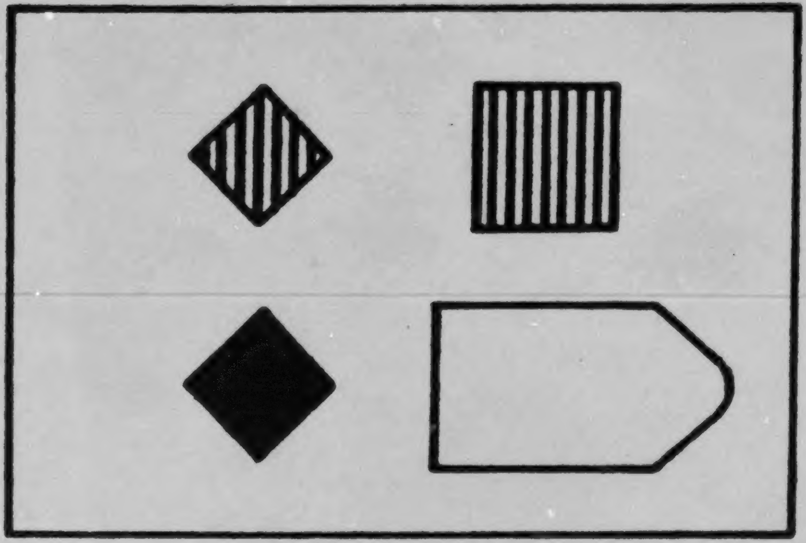


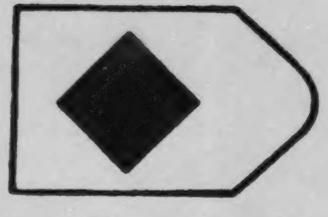


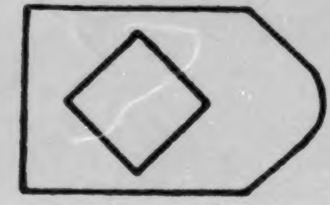


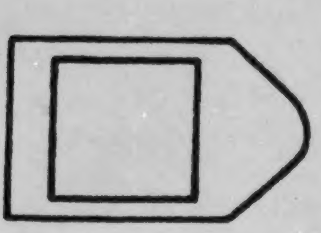


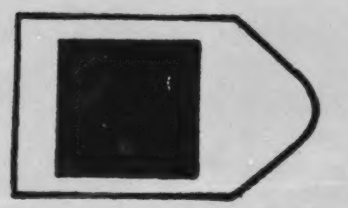
45

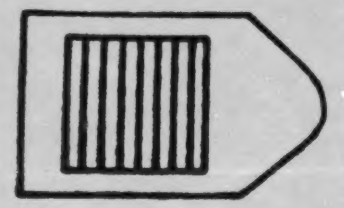


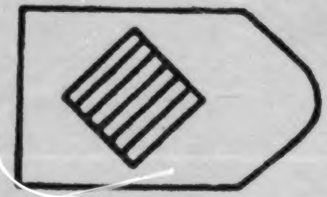




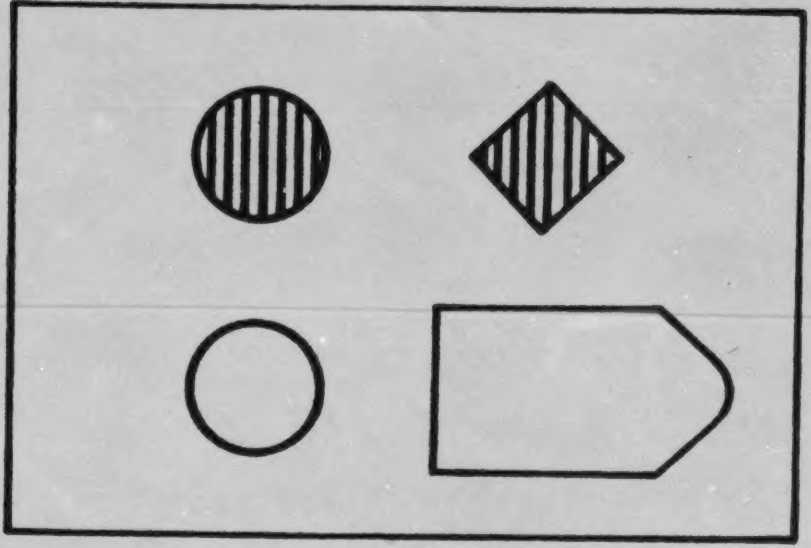


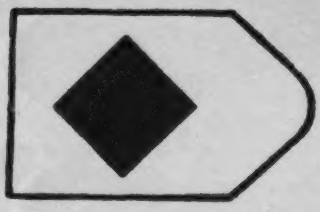


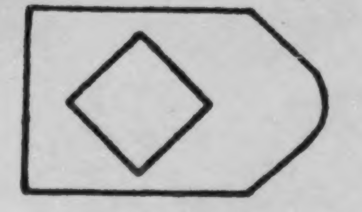


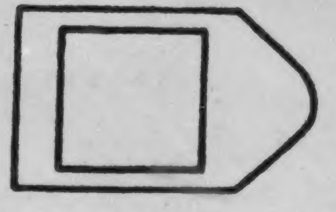


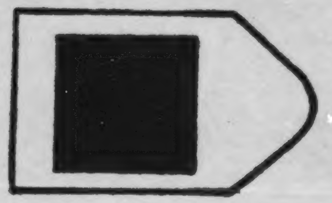
46

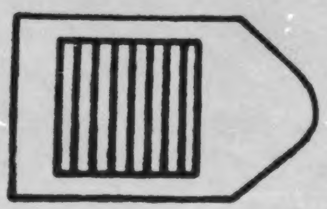


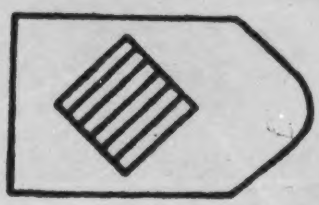












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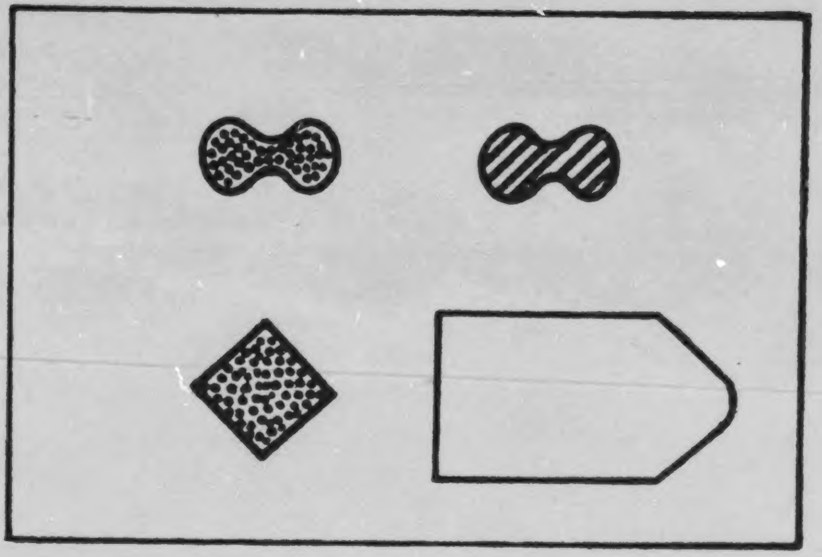
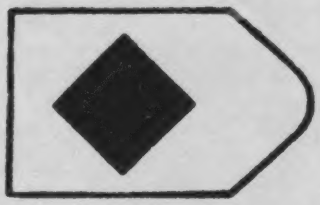
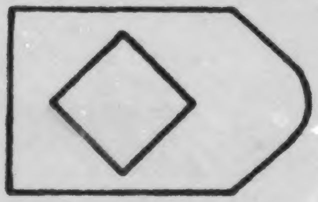
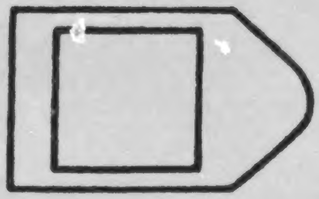
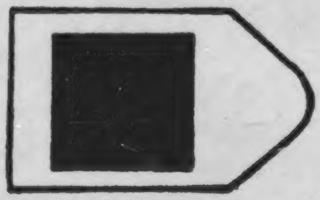
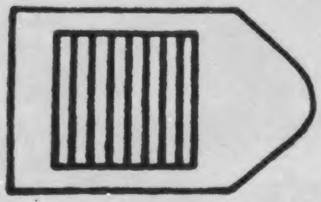


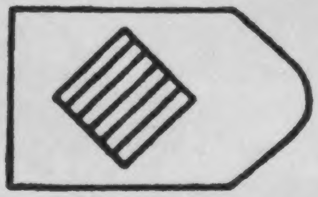


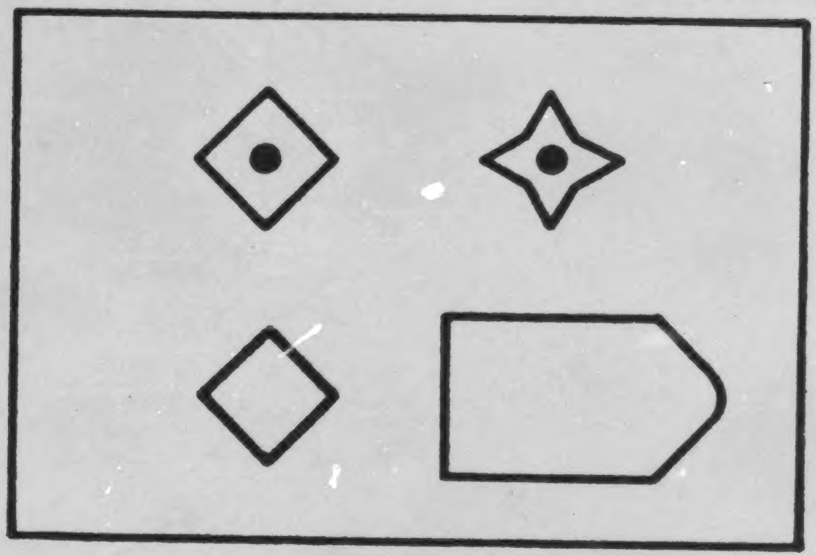


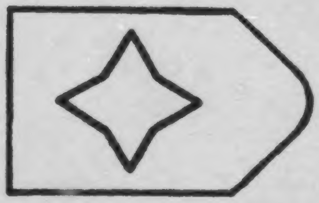


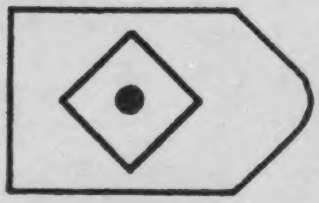


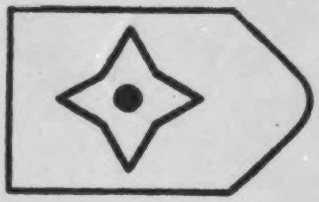


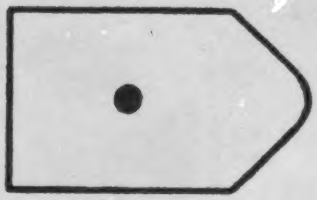


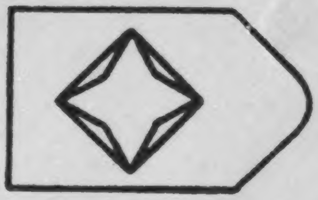


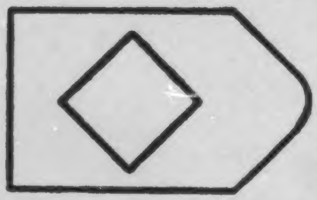




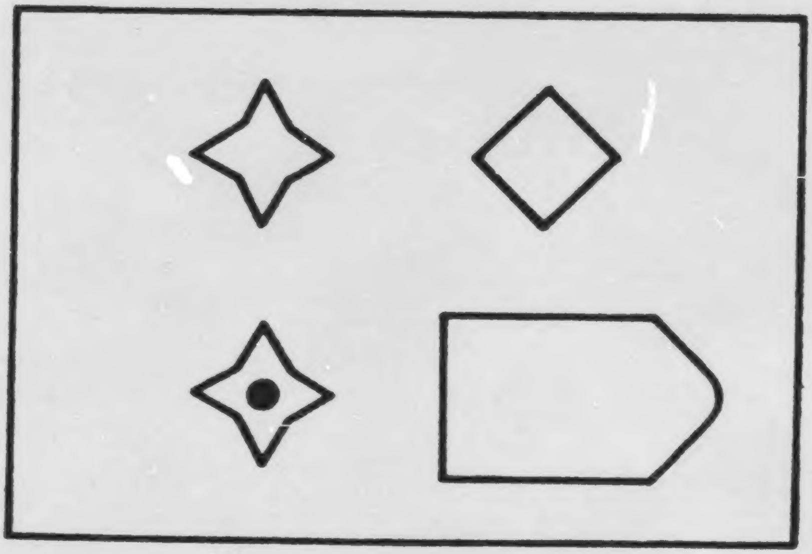


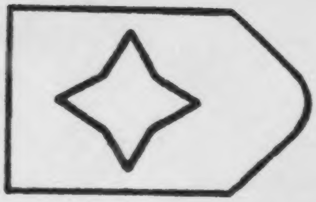


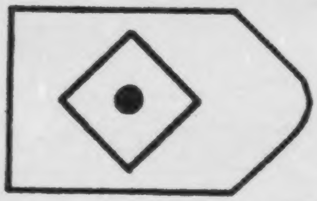


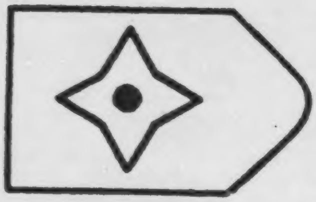


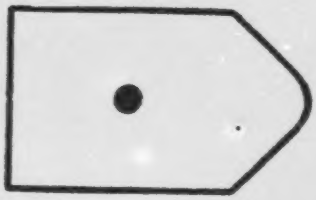
49

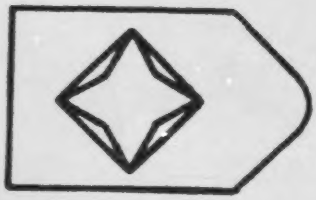


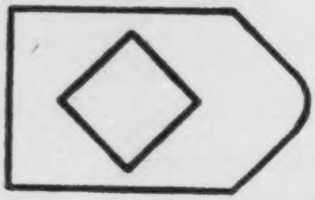












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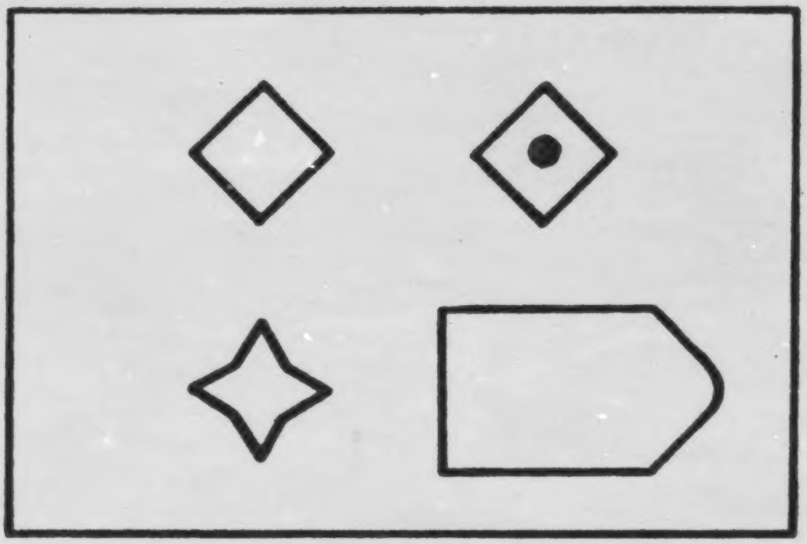
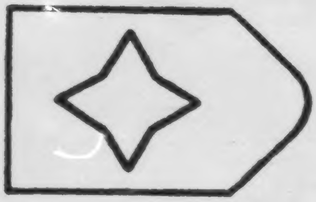
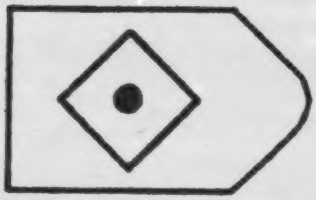
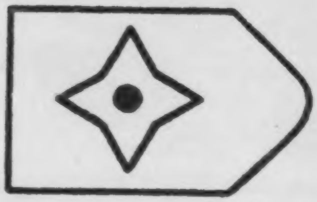
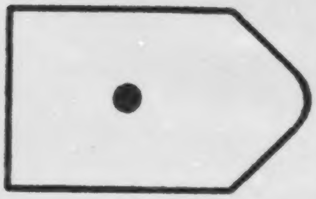
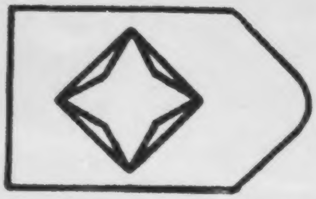


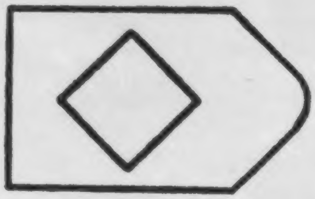




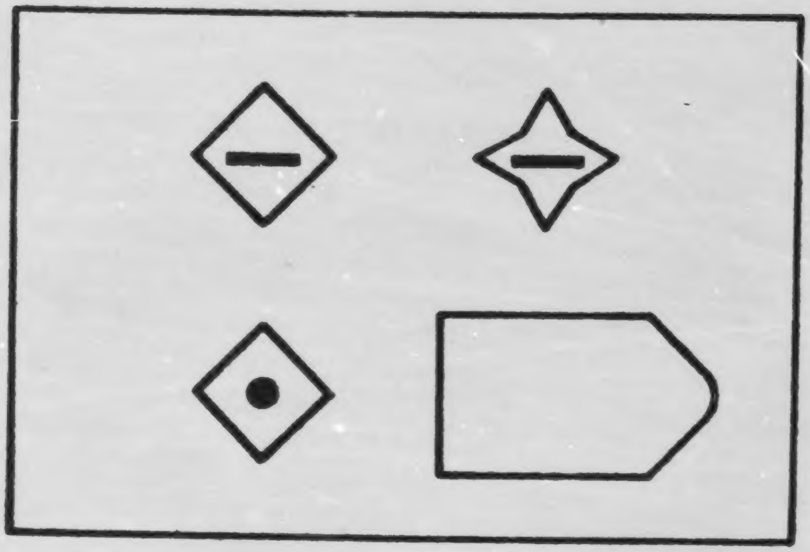


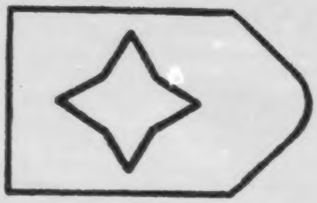


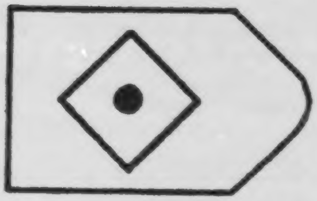


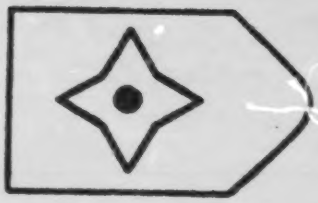


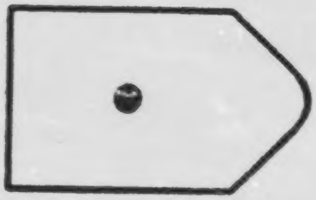
51

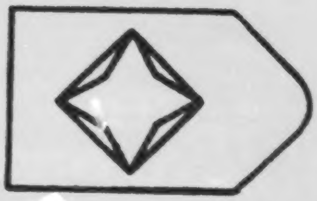


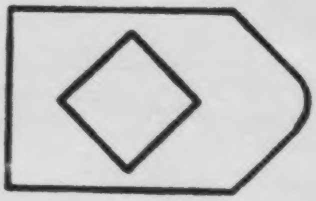












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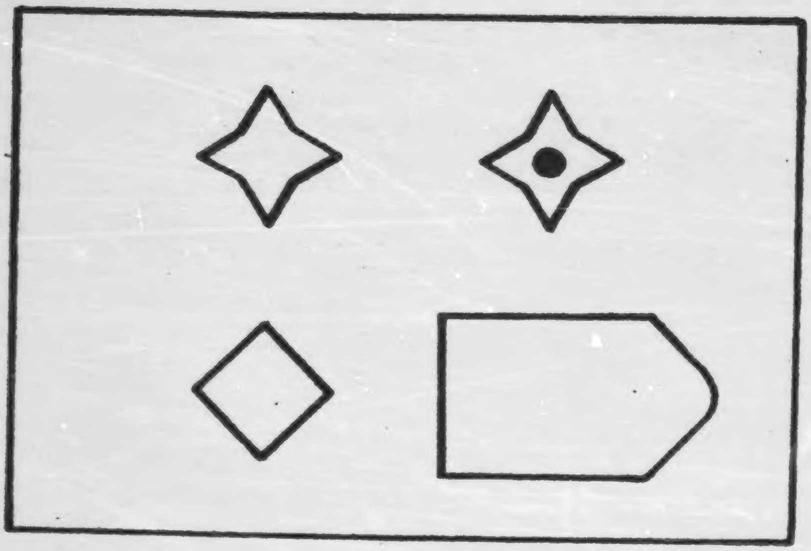

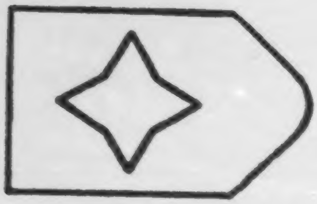

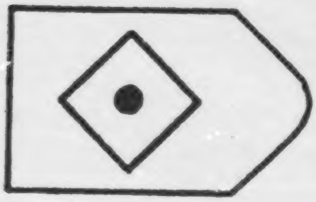

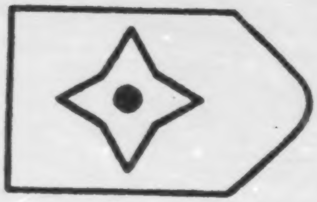

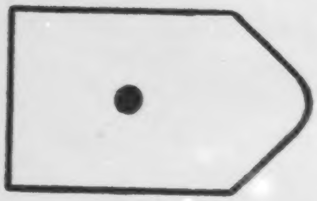

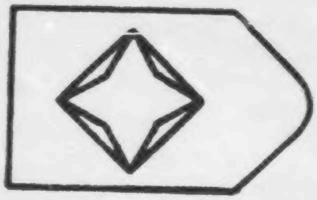

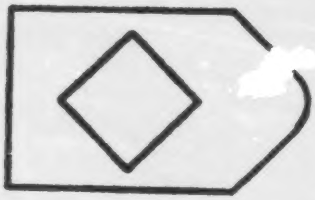

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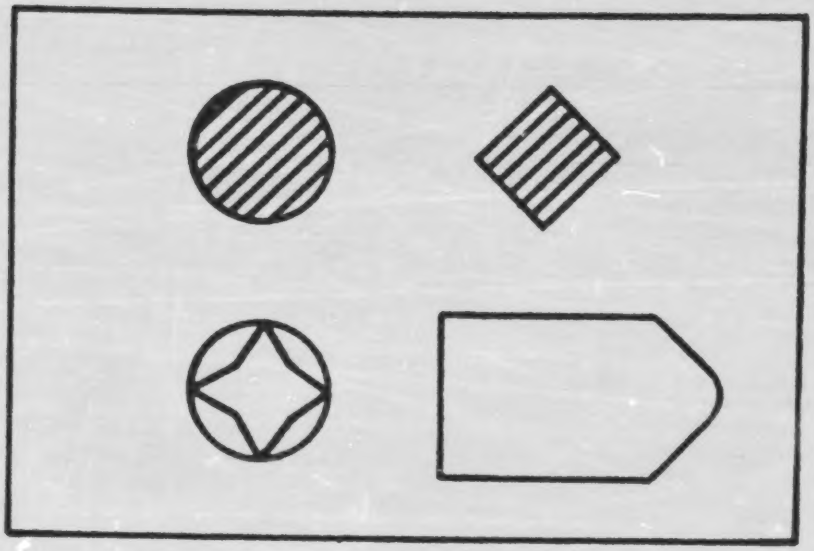

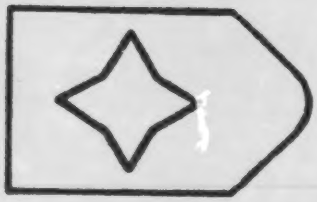

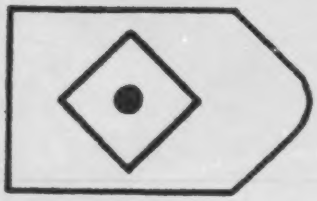

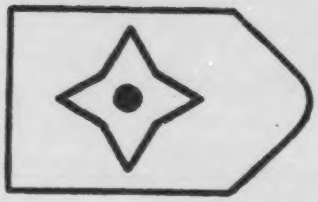

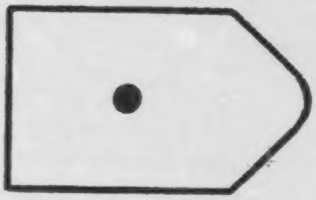

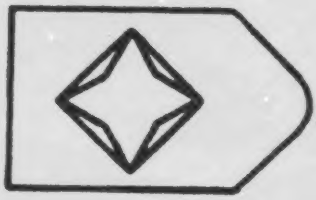

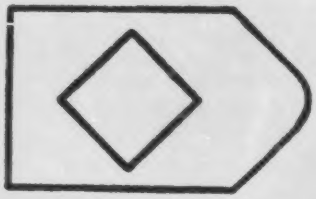

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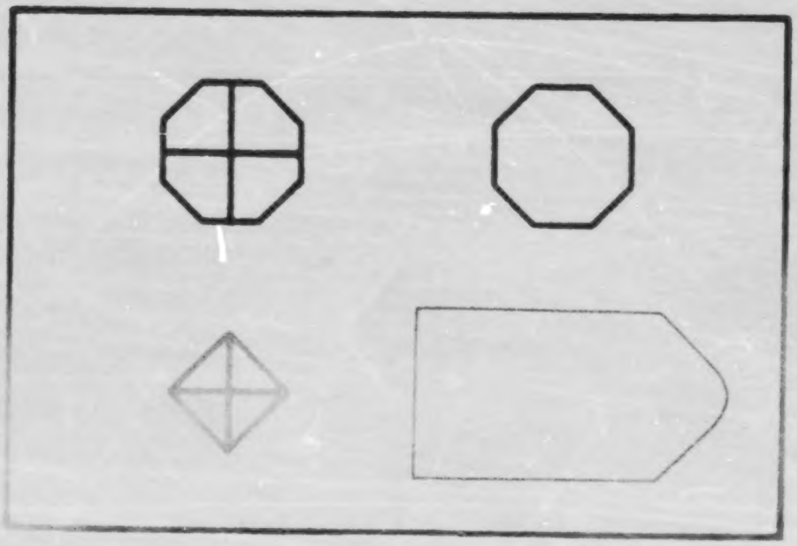

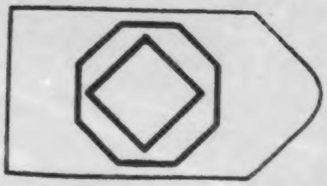

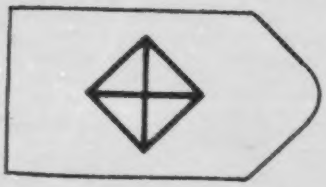

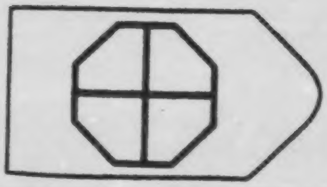

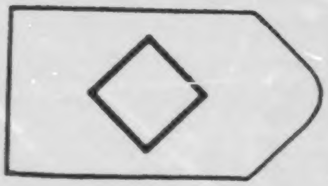

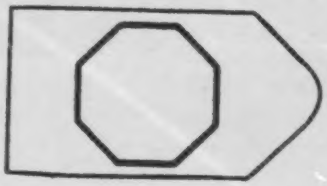

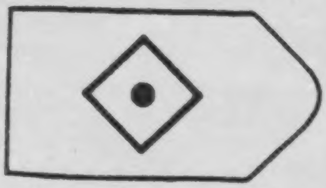

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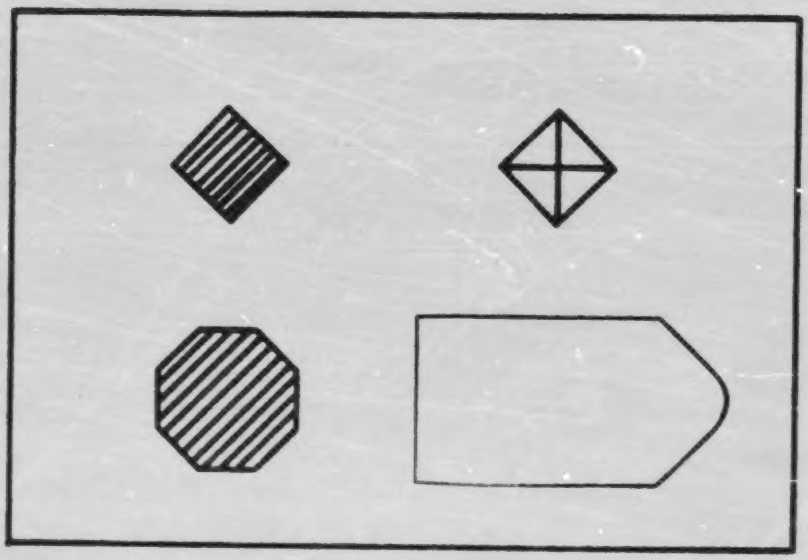

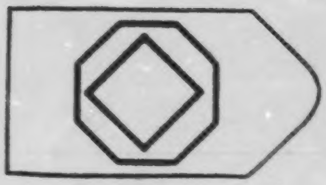

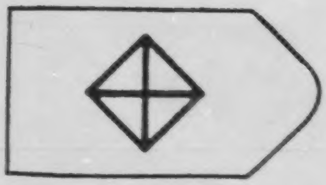

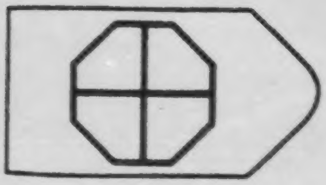

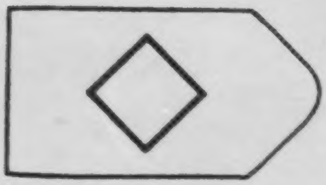

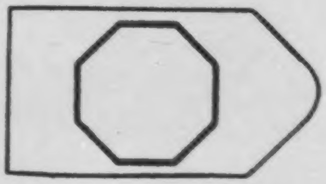

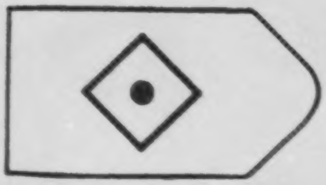

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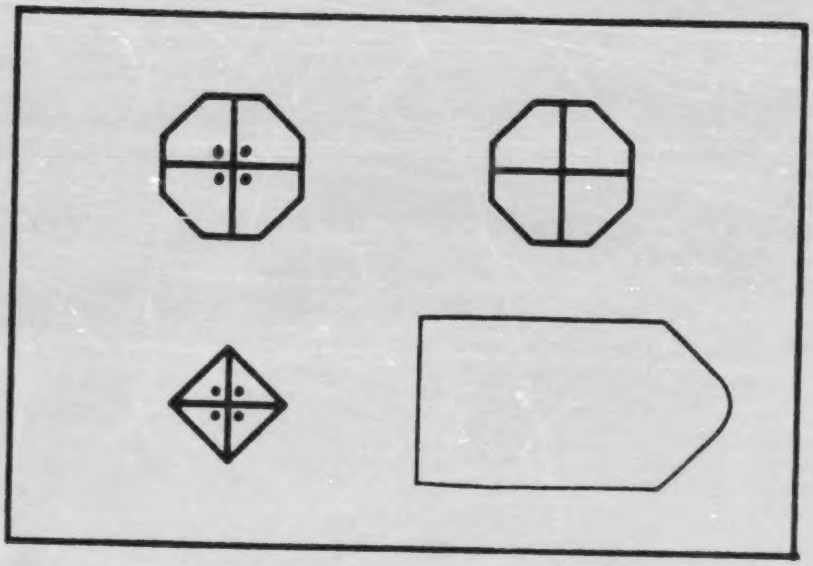

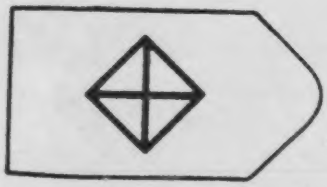

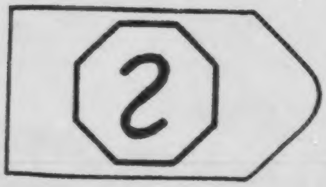

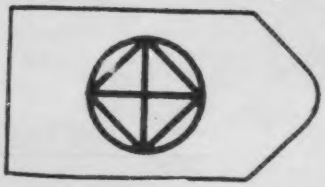

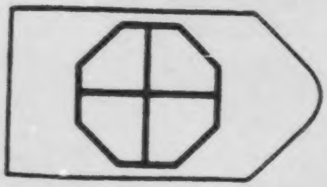

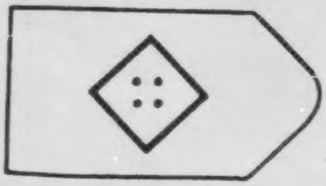

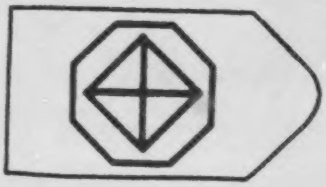

APPENDIX C

*Series Learning Potential Test Booklet, Form A (apples)

*Series Learning Potential Test Booklet, Form B (teddybears)

*Series Learning Potential Training Booklet

Series Learning Potential Manual, English

Series Learning Potential Manual, Spanish

*The appended samples are reduced in size from the originals. The originals were printed on colored paper 8½ by 14 inches. Due to the Xeroxing process, the solid areas of black are lost. Samples of the original tests are available from the Research Institute.

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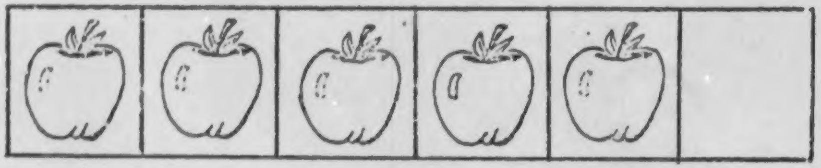

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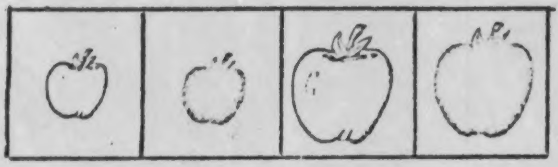

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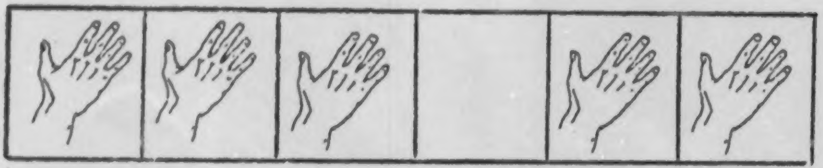

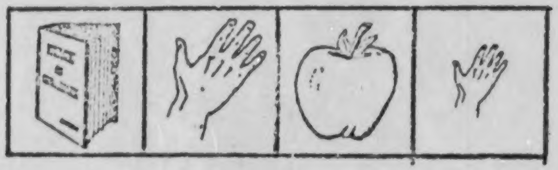

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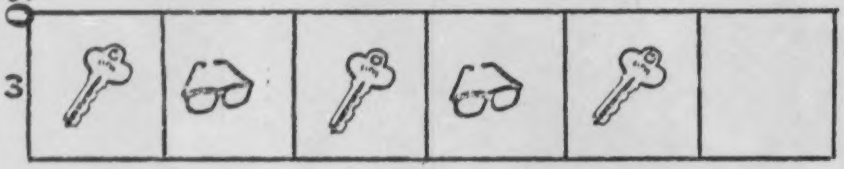

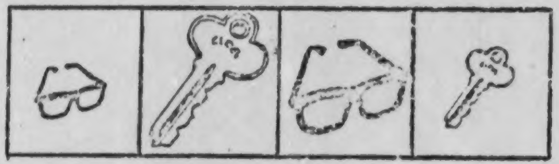

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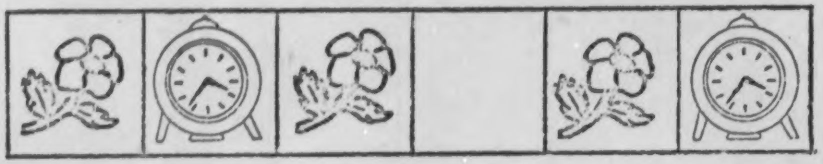

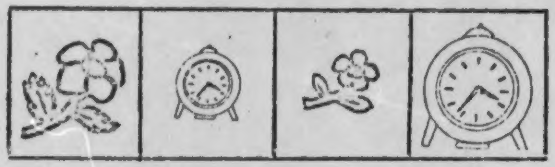

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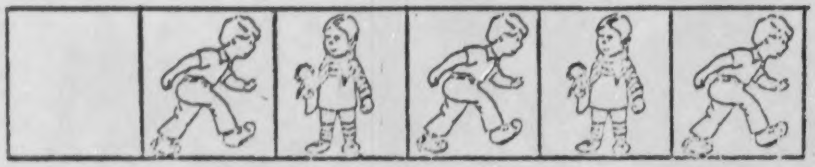

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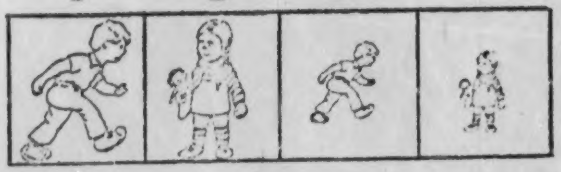

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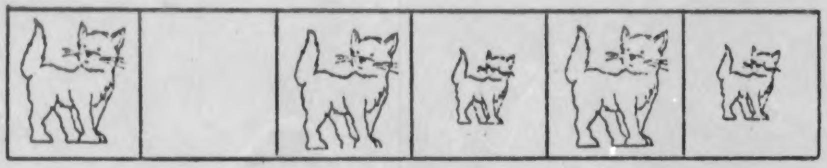

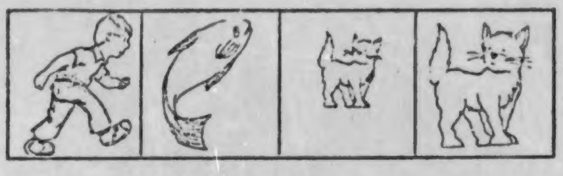

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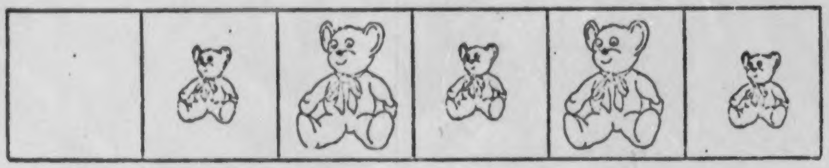

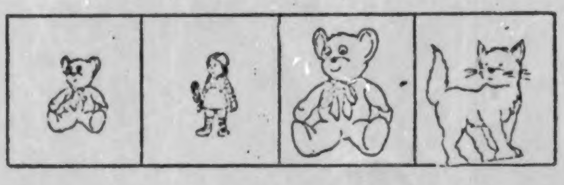

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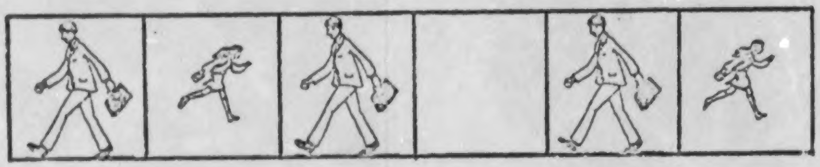

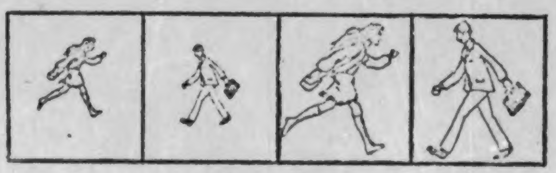

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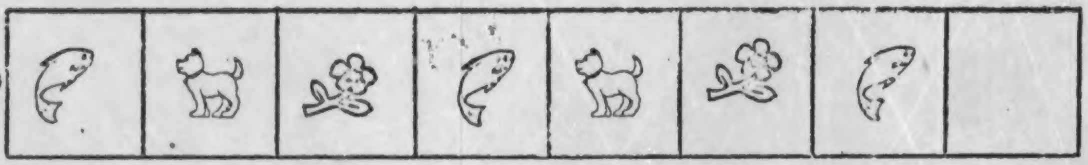
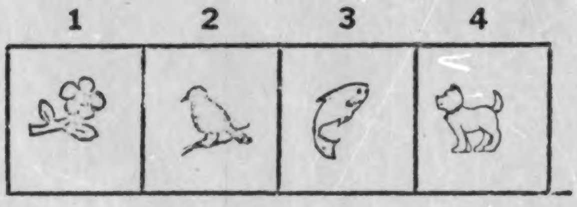

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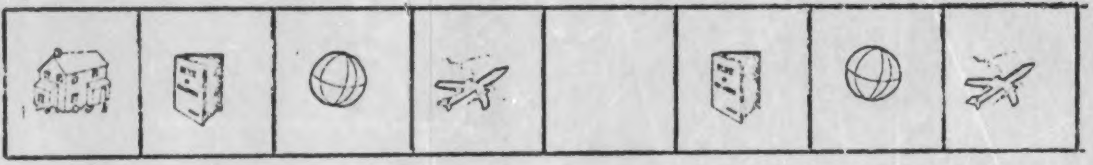
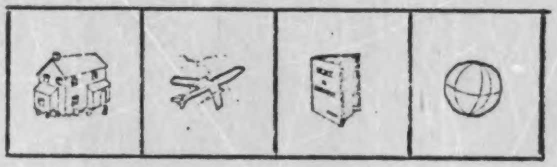

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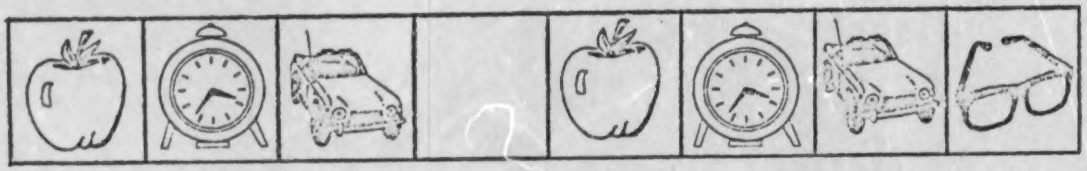
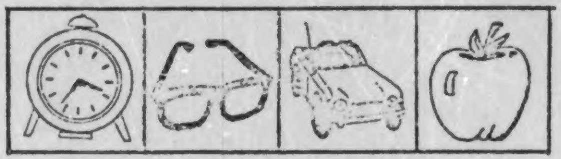

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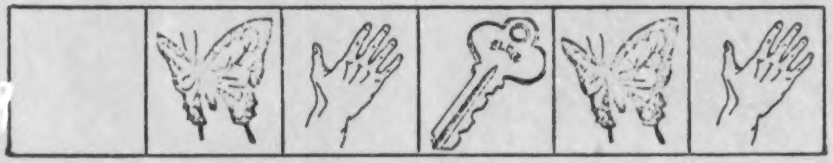
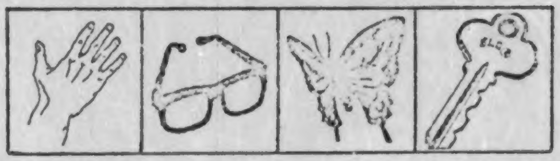

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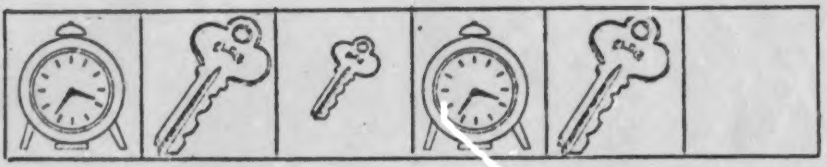

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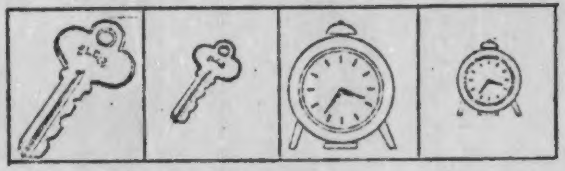

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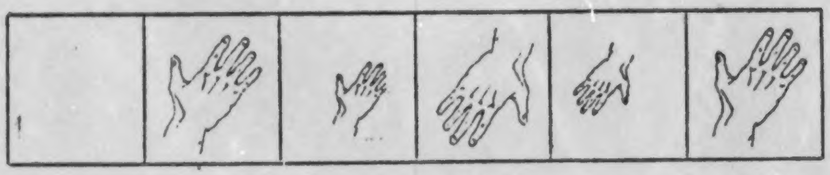

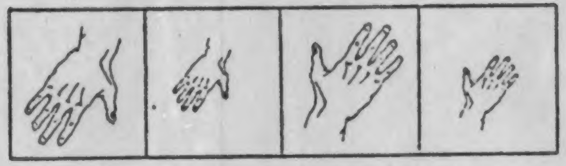

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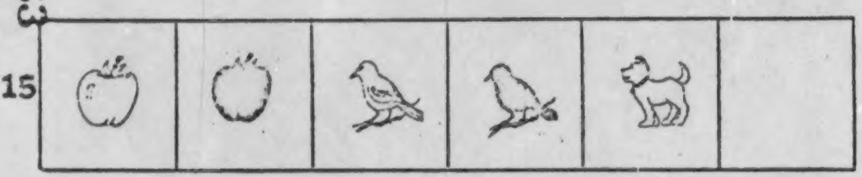

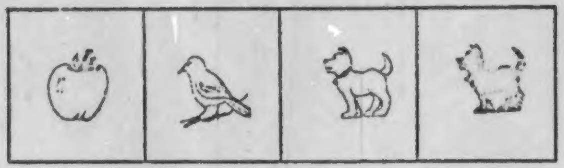

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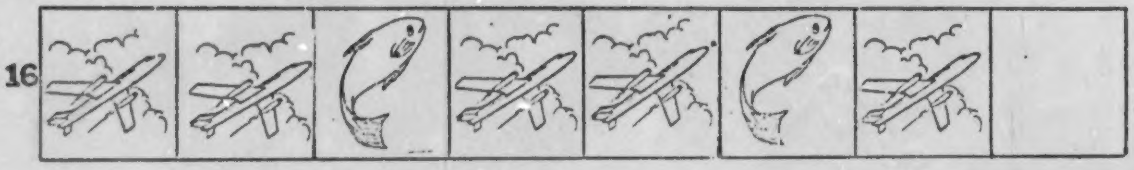

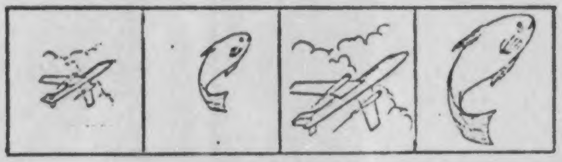

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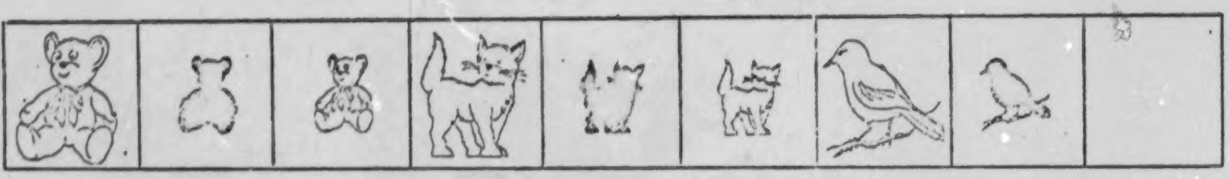

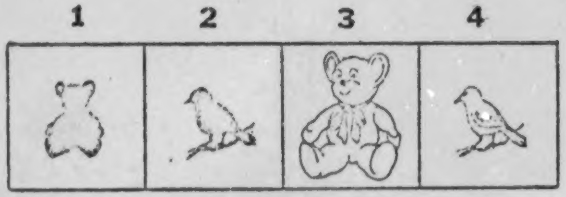

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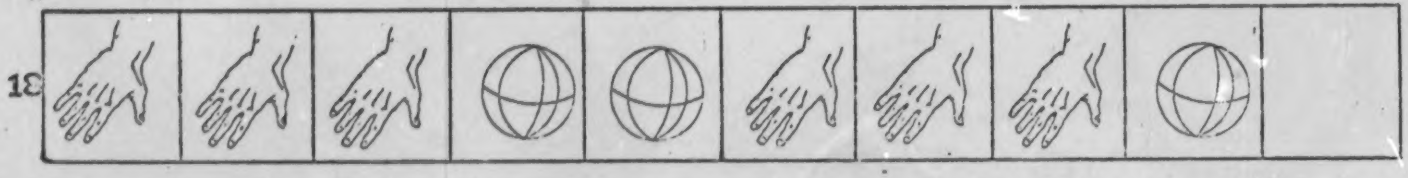
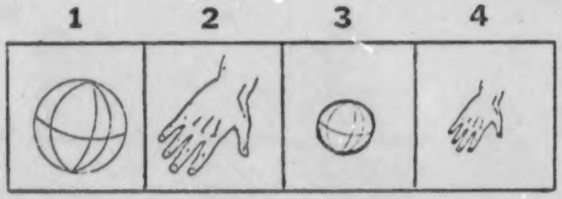
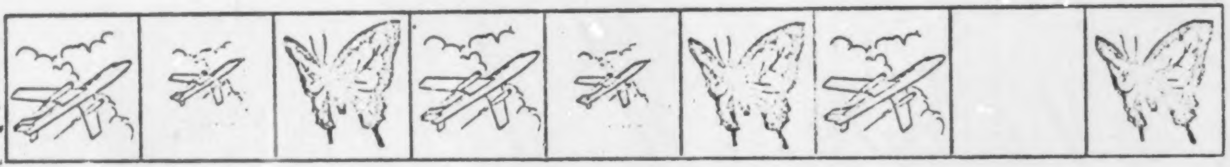




19 

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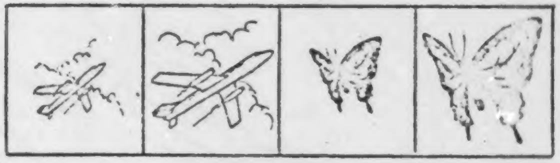
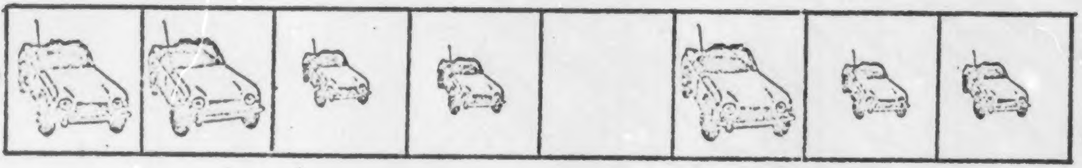
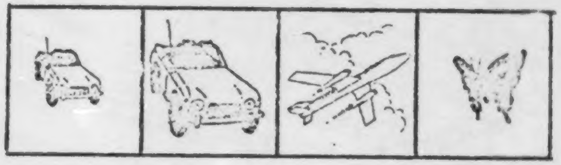
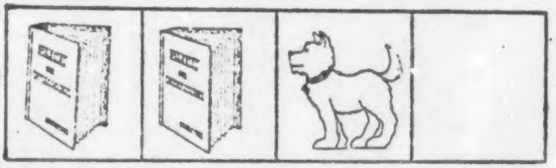
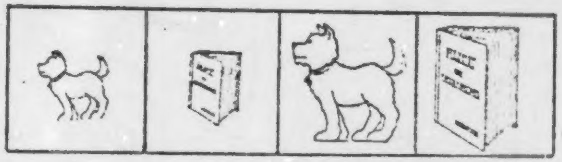
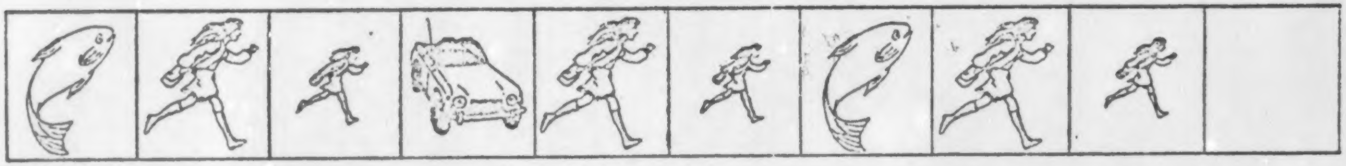


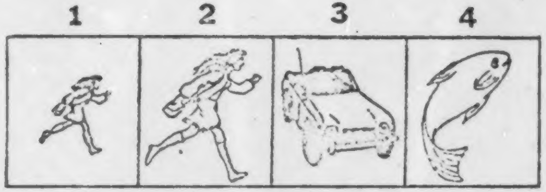
20 

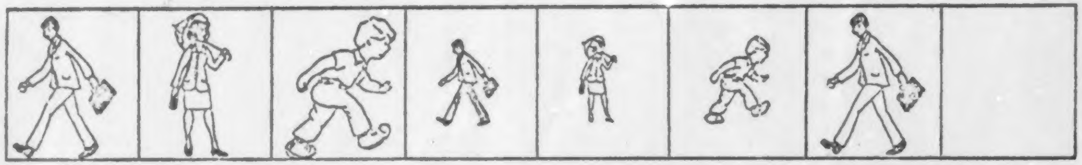


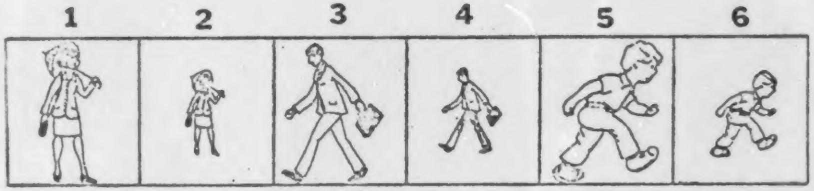
21 

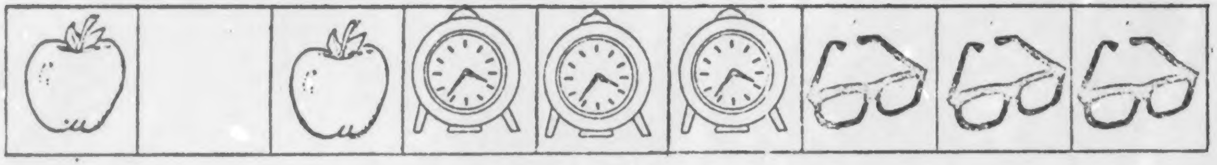


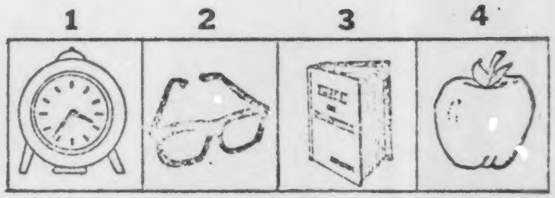
22 

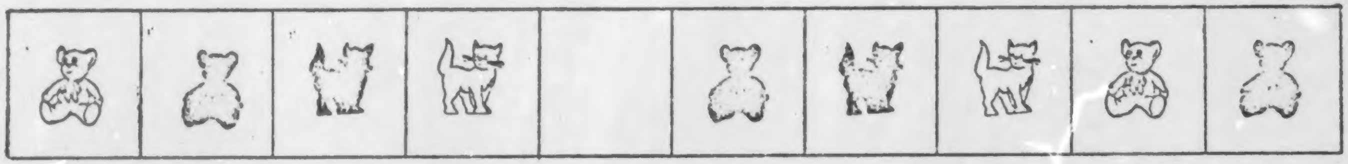


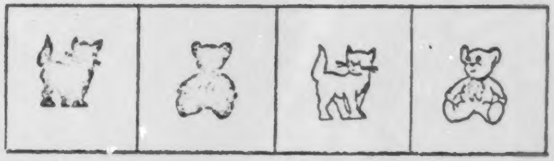
23 



24 



25 



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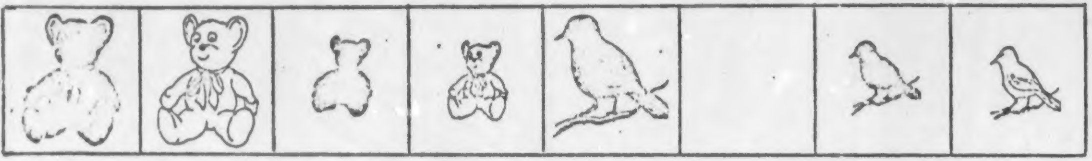

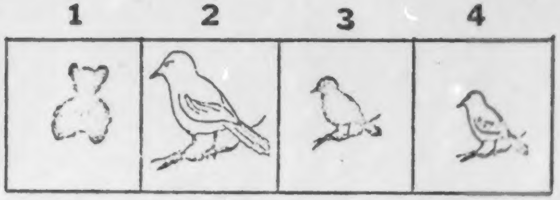

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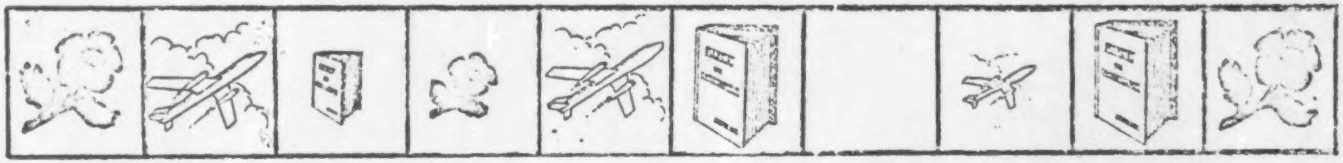

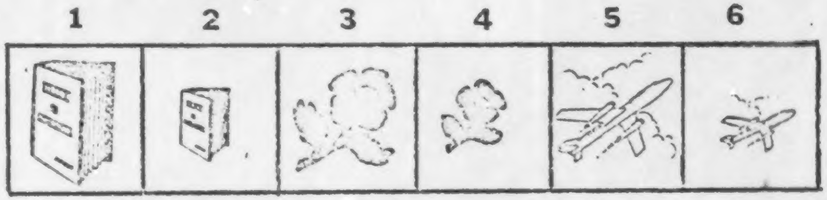

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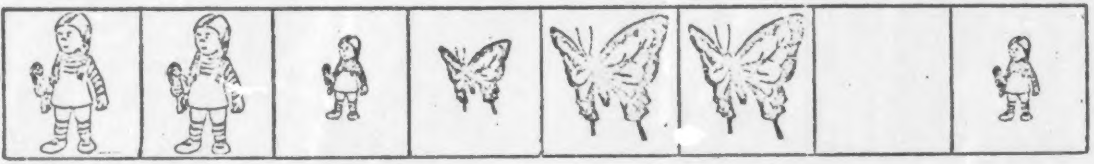

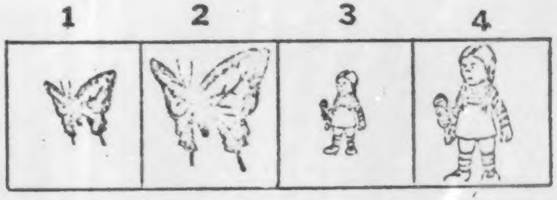

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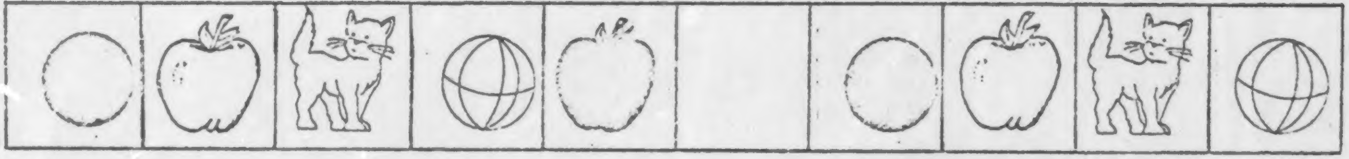

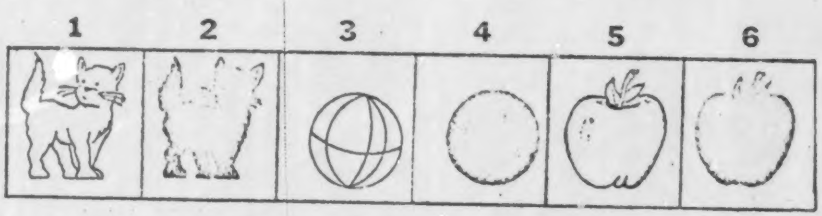

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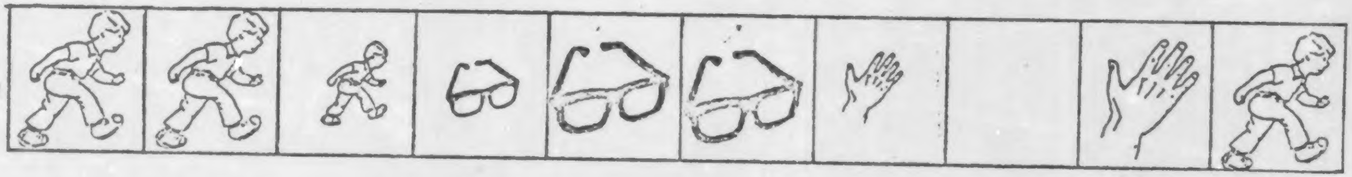

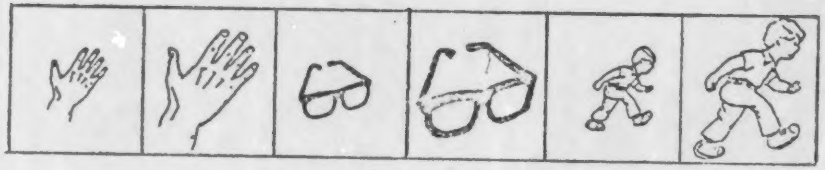

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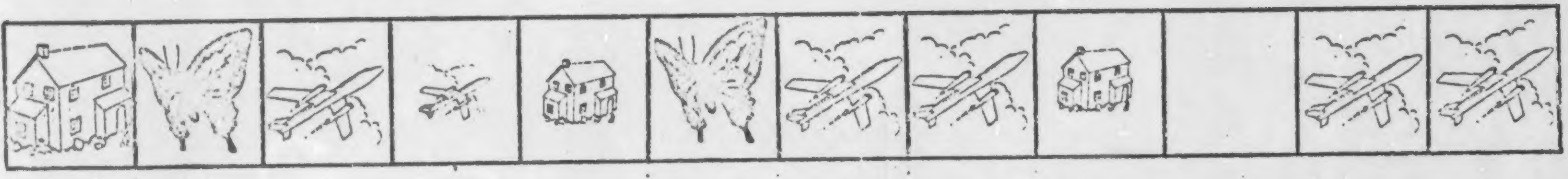

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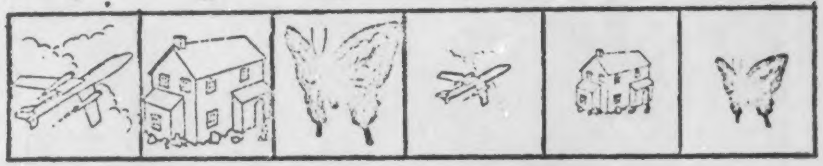

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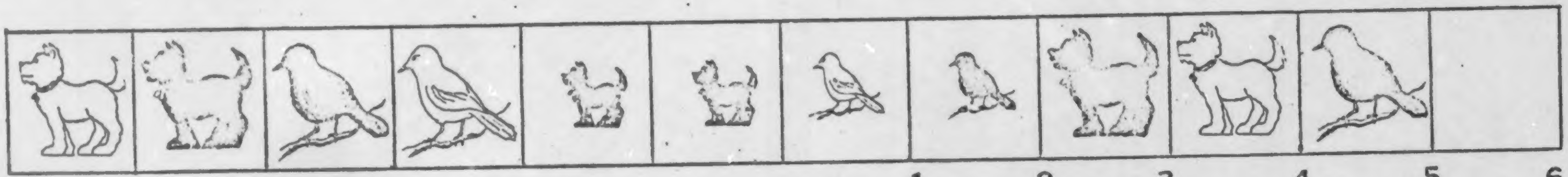

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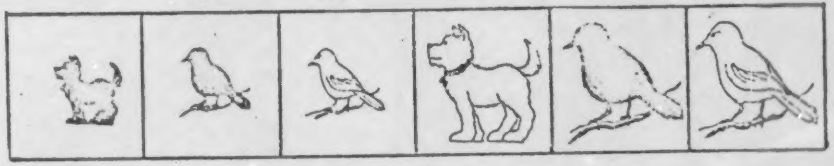

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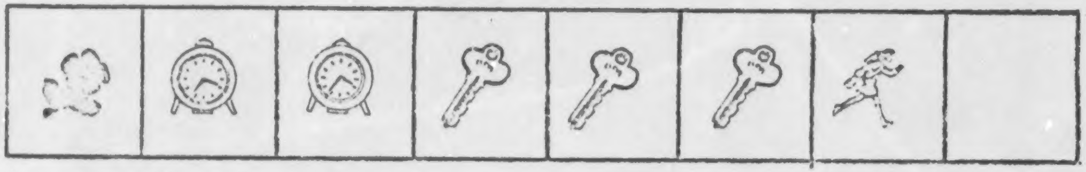

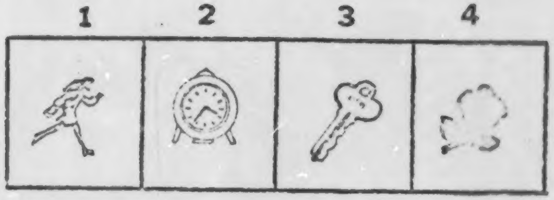

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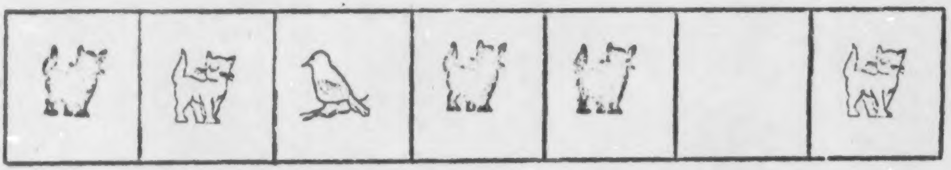

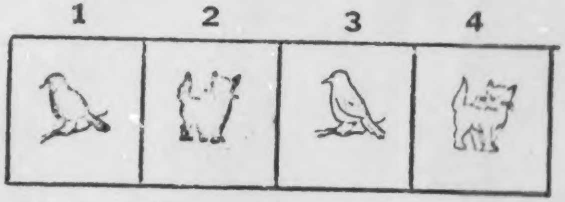

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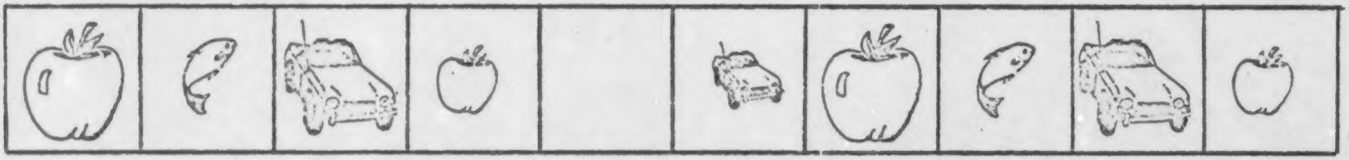

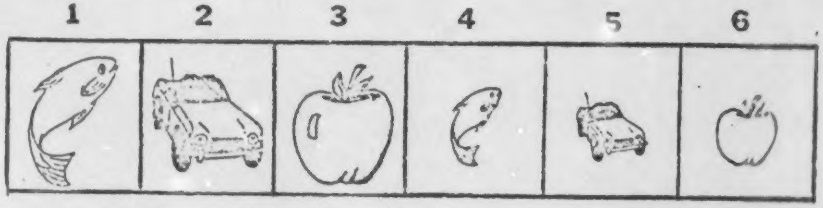

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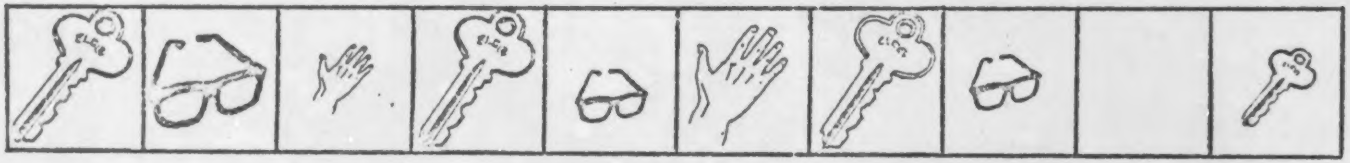

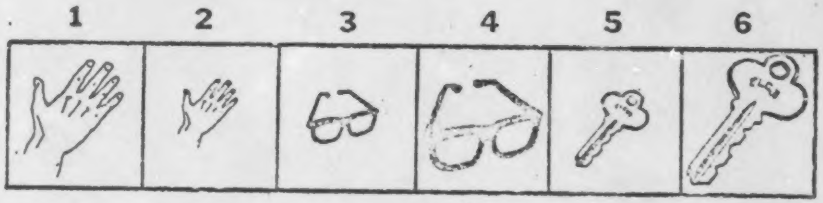

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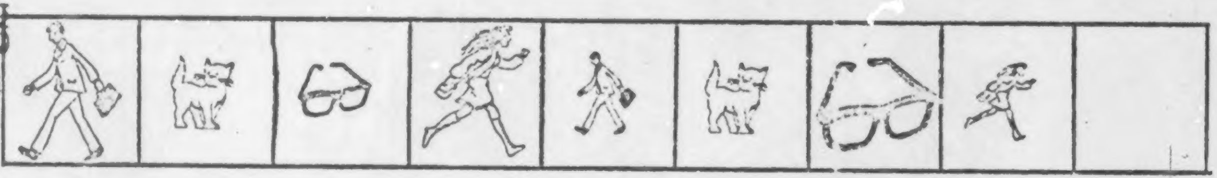

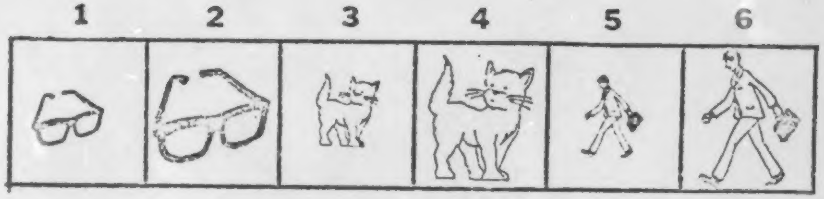

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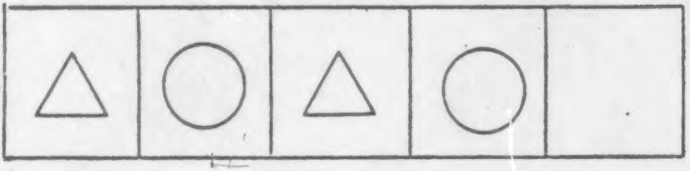

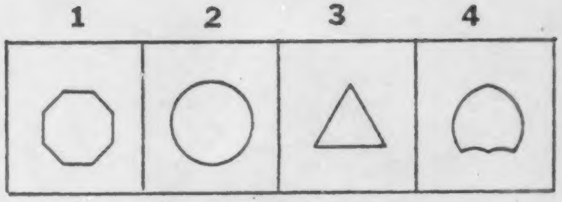

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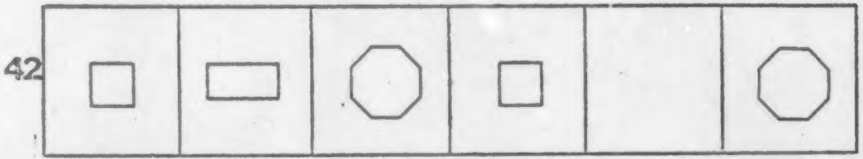

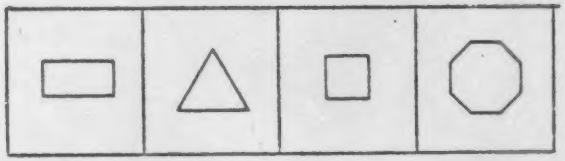

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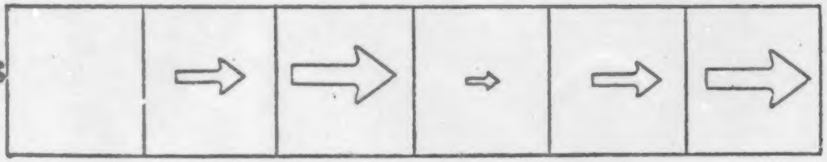

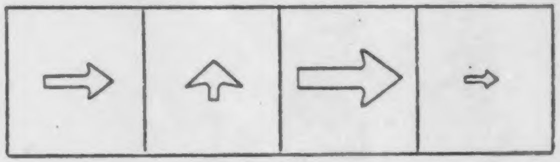

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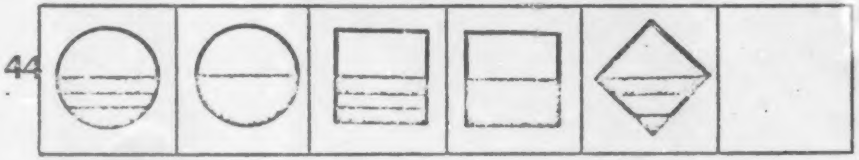

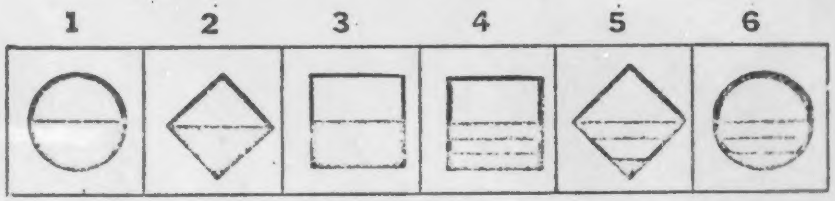

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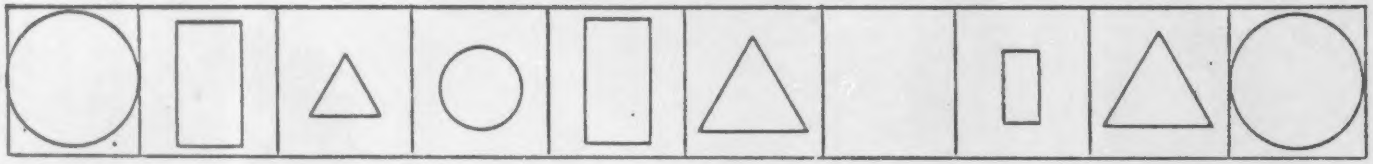

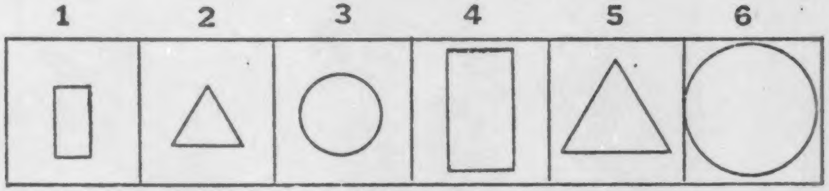

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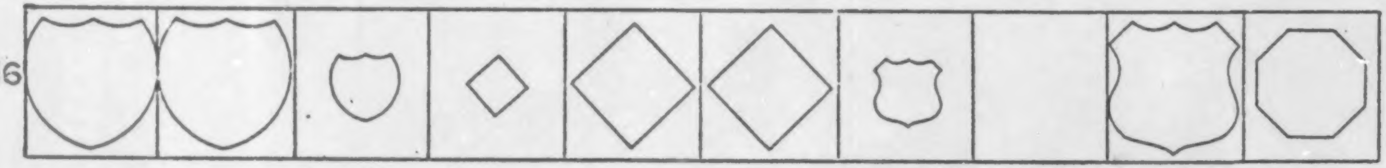

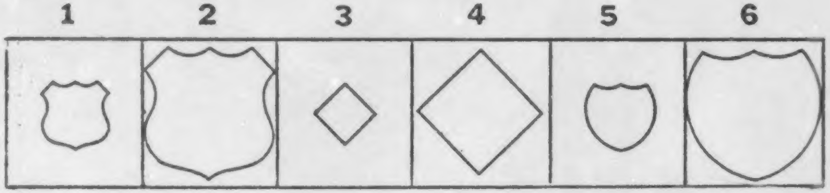

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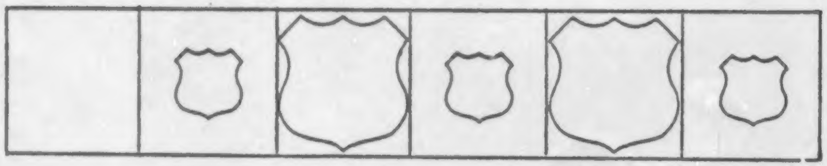

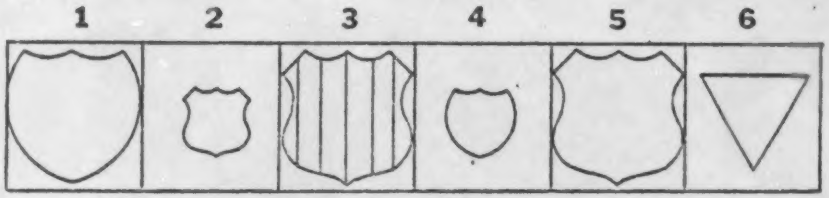

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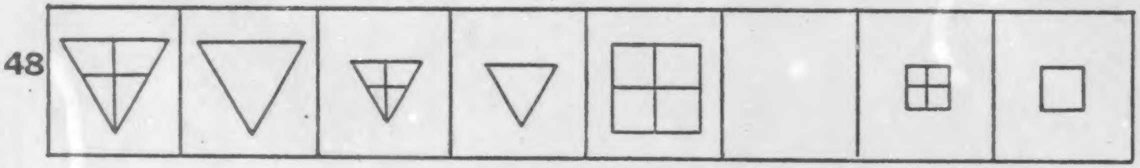

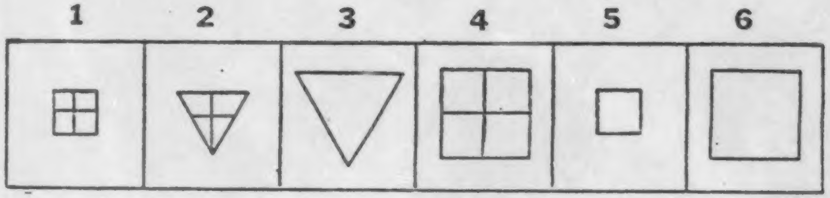

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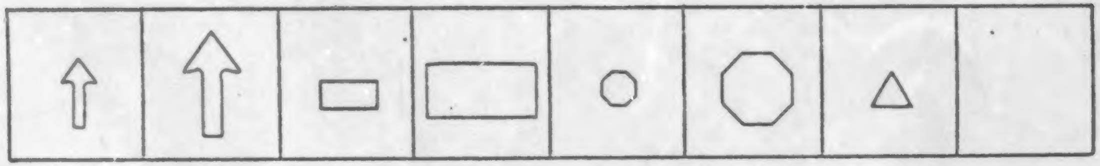

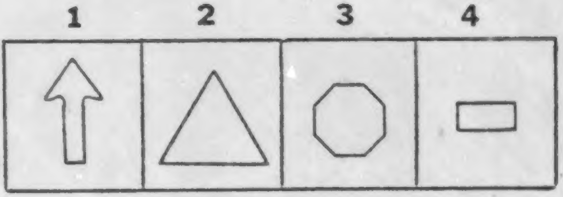

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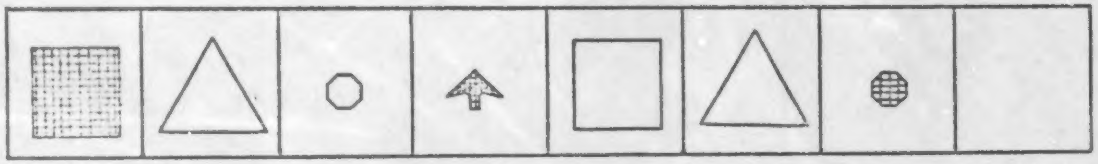

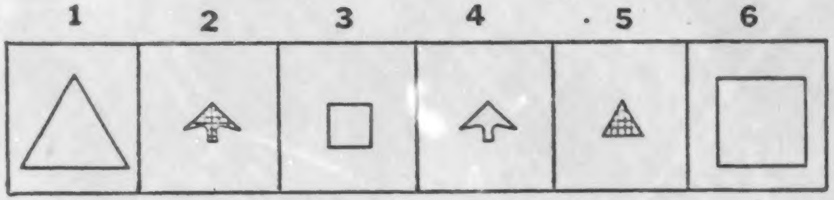

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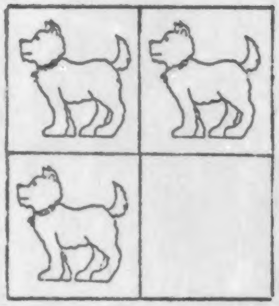

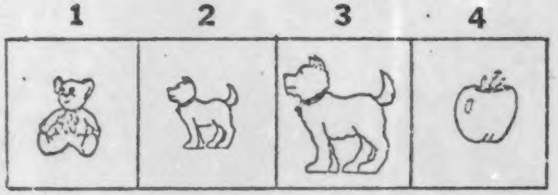

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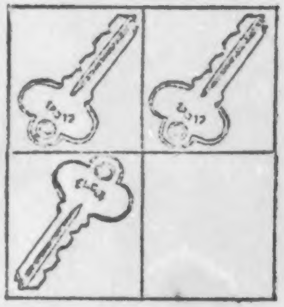

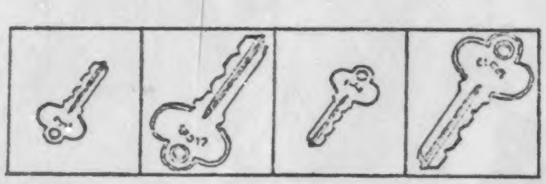

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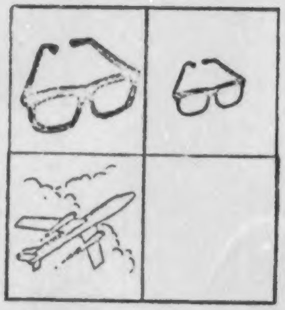

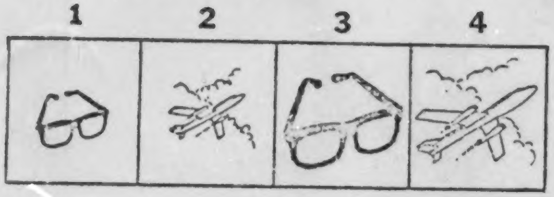

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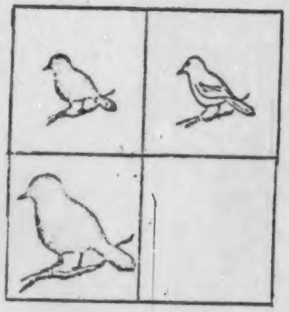

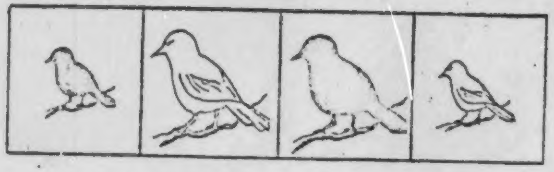

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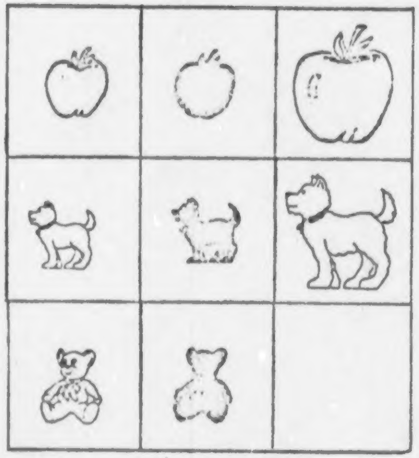

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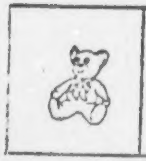

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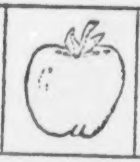

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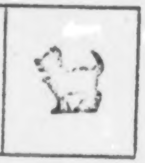

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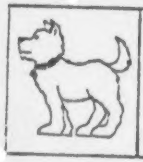

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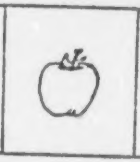

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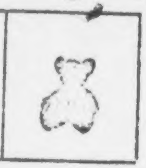

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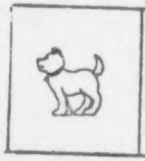

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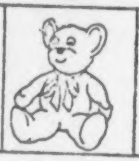

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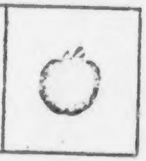

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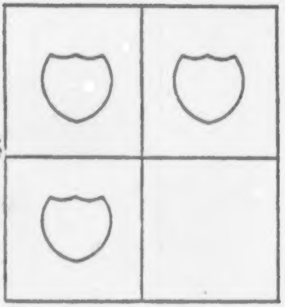

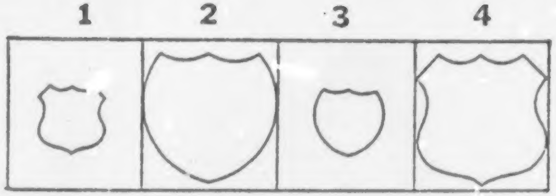

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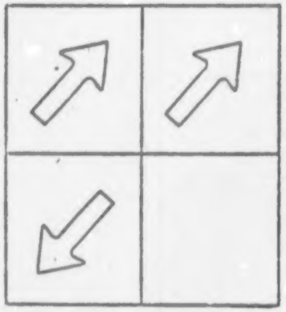

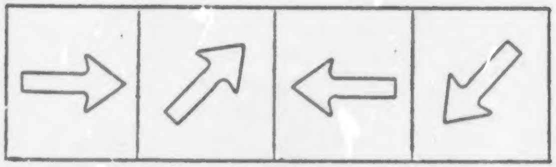

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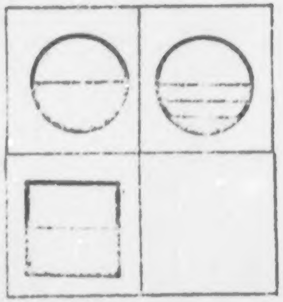

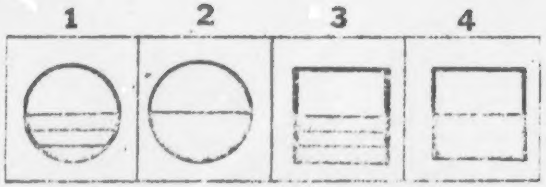

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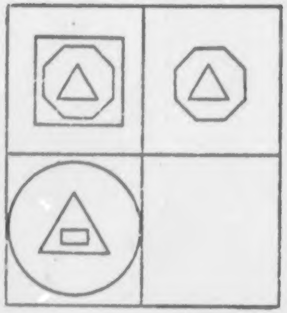

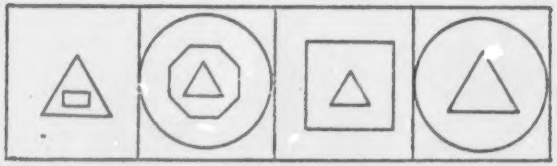

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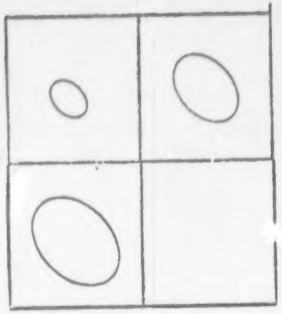

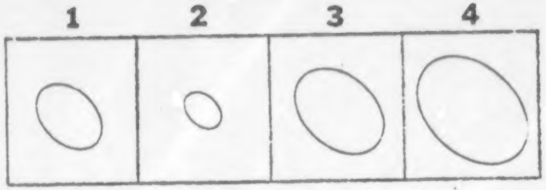

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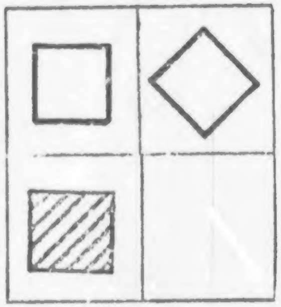

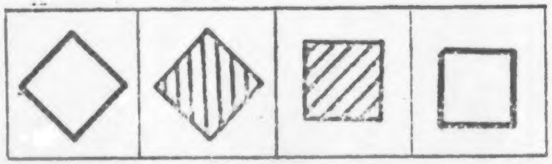

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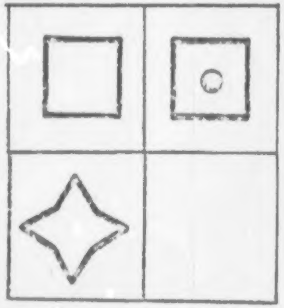

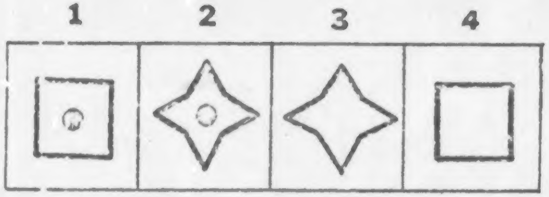

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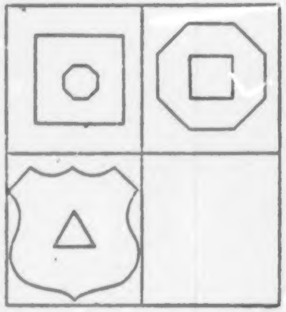

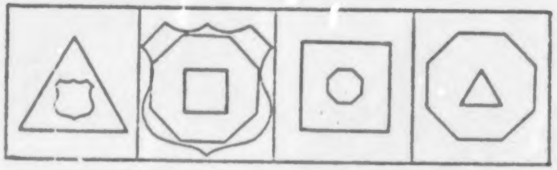

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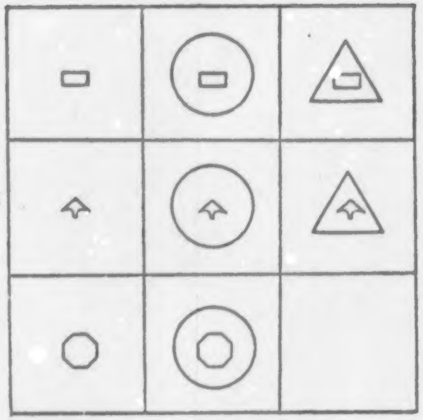

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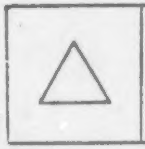

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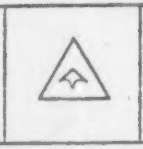

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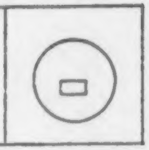

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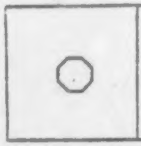

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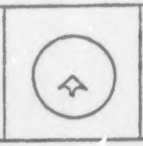

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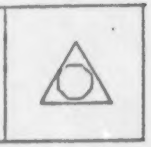

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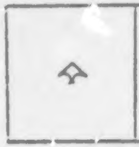

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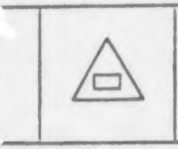

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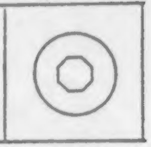

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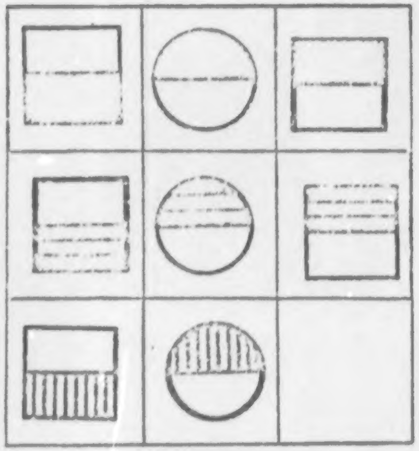

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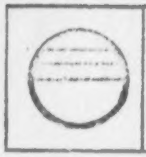

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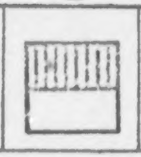

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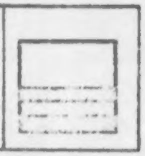

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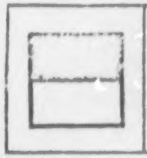

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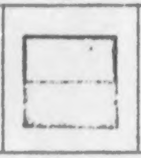

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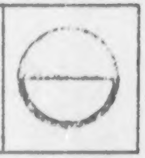

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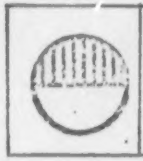

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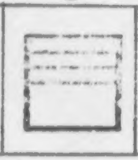

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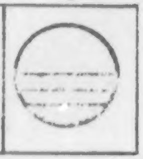

TB

post

THE SERIES GAME

NAME ______________________________

TEACHER ______________________________

GRADE ______________________________

SCHOOL ______________________________

AGE ______________________________

DATE ______________________________

Do not write in this space!

ID __________ Tester __________

	TB		AP	G
Series				
pict.	___		___	___
geom.	___		___	___
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Matr.				
pict.	___		___	___
geom.	___		___	___
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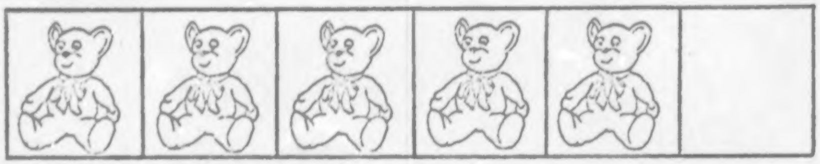

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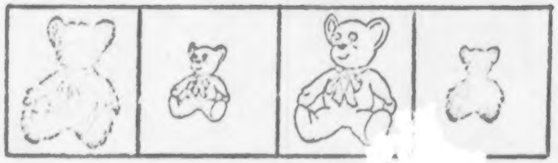

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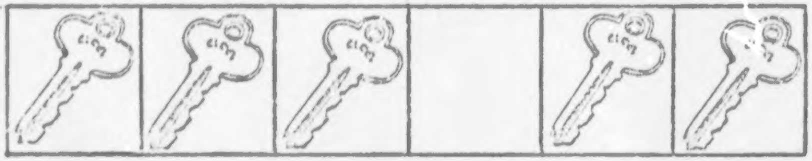

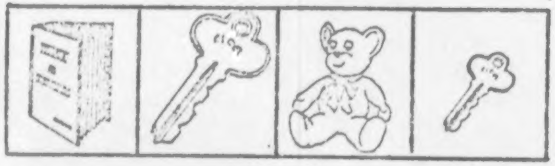

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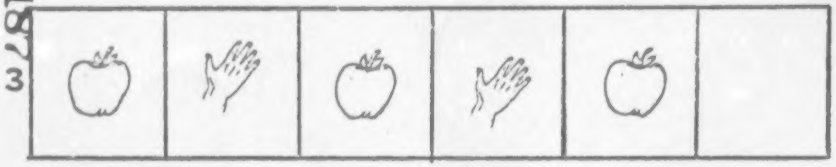

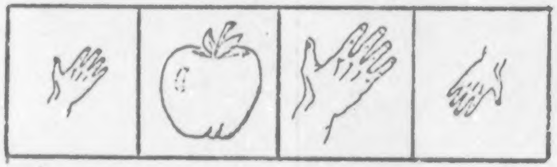

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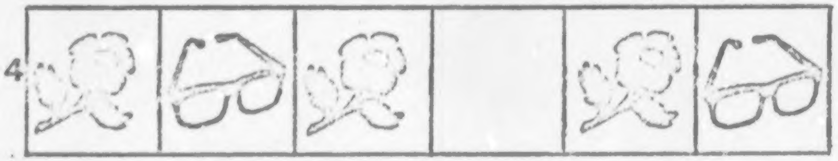

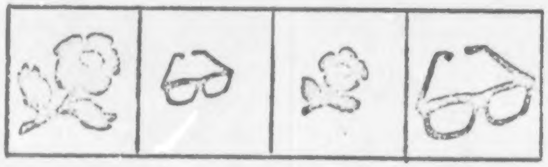

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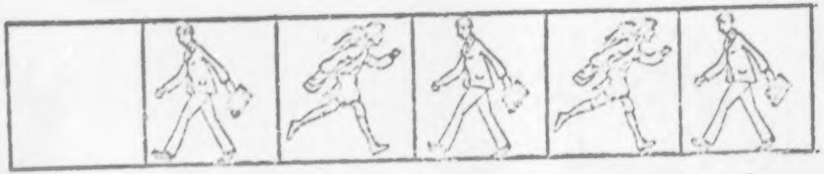

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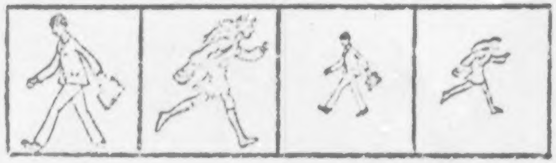

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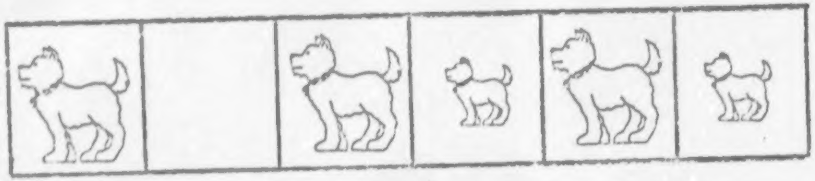

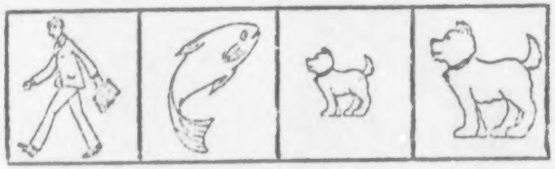

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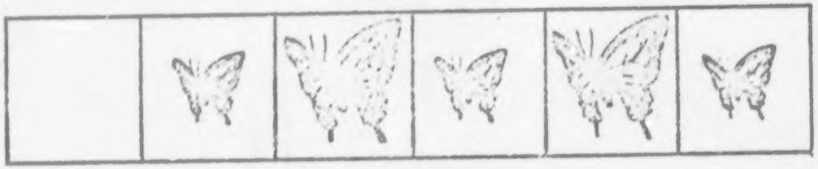

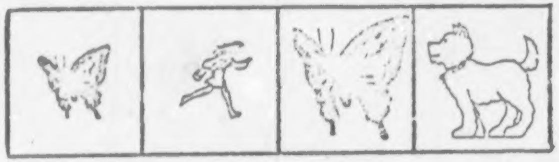

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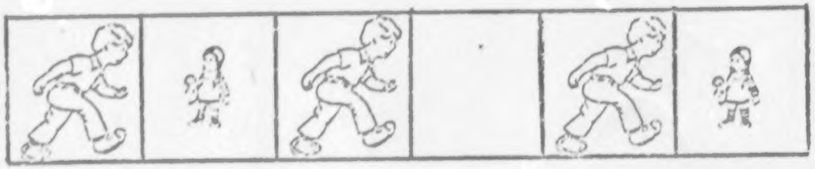

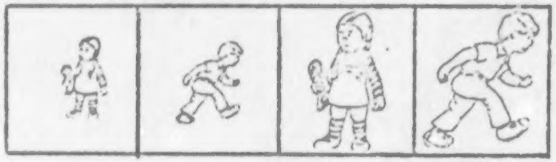

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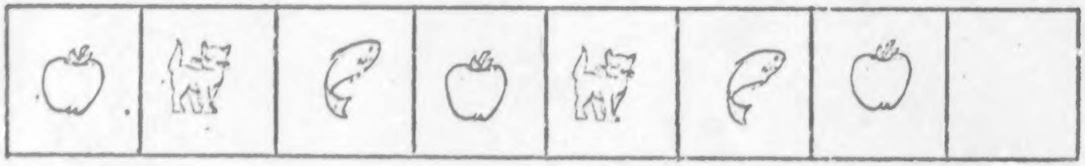

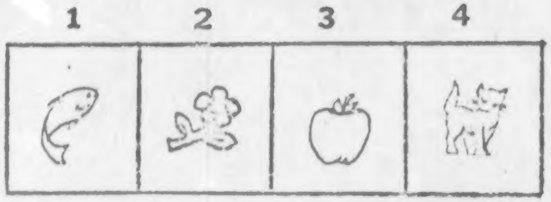

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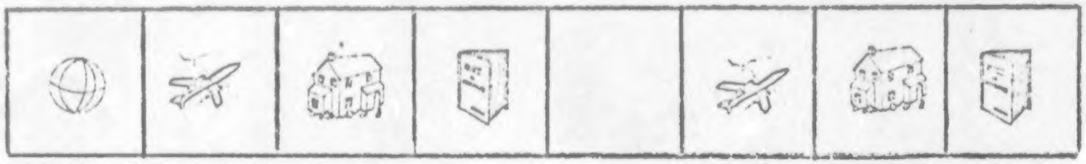

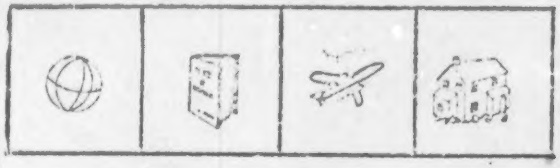

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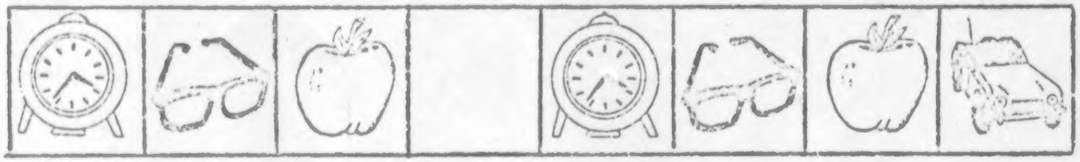

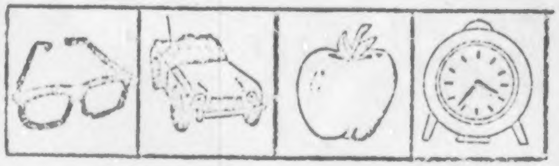

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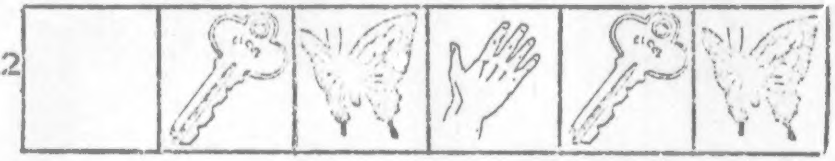

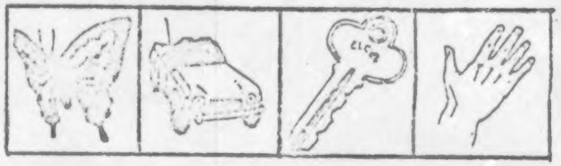

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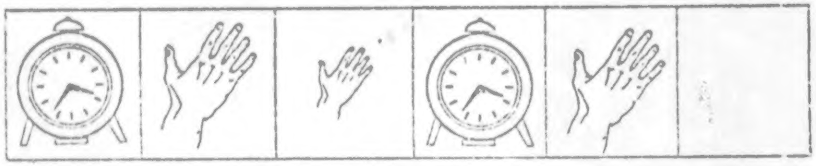

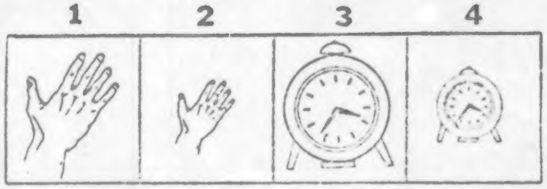

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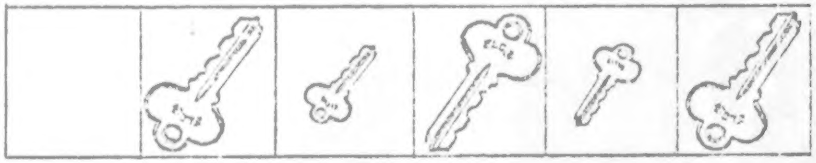

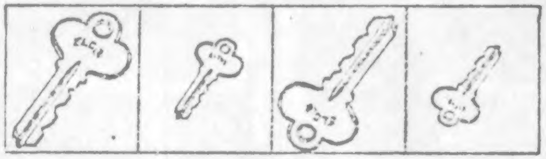

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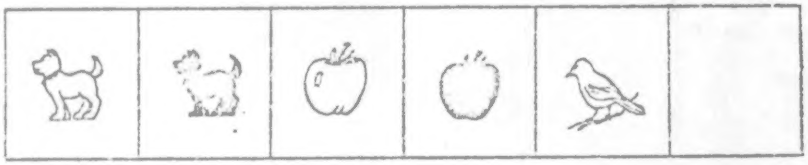

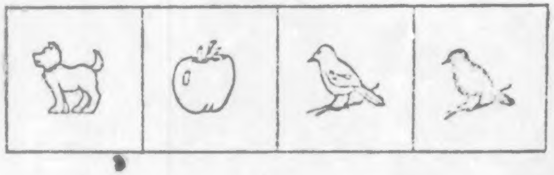

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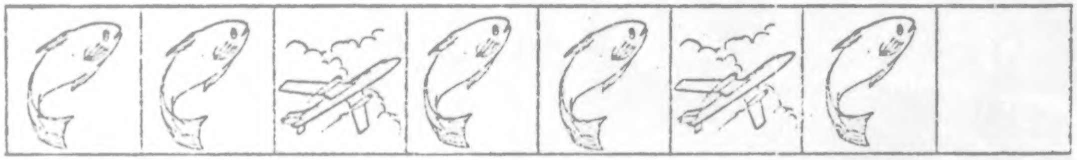

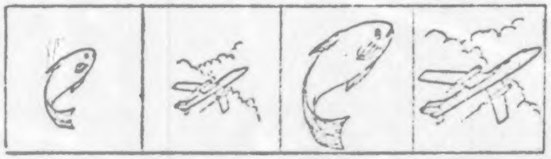

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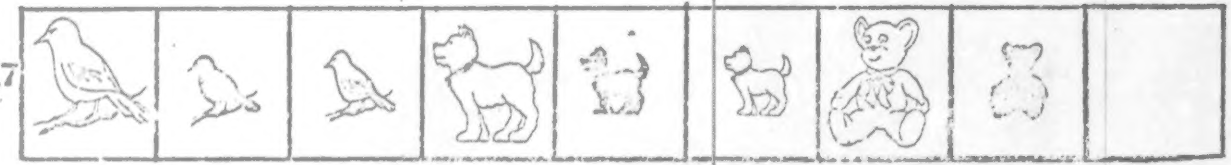

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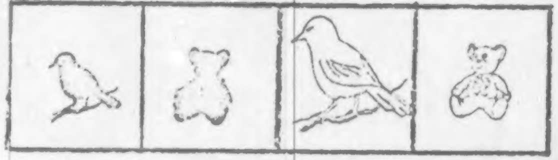

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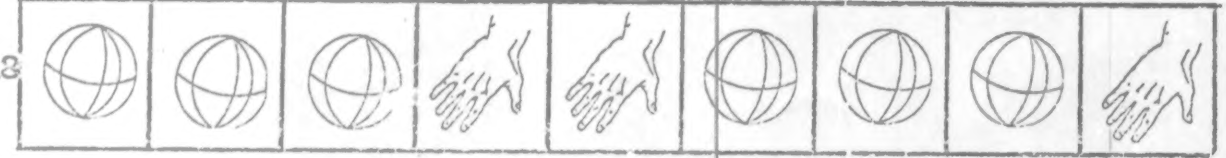

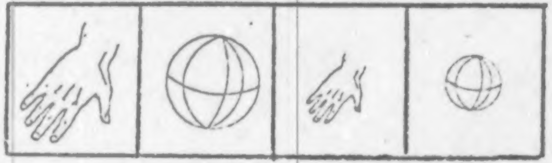

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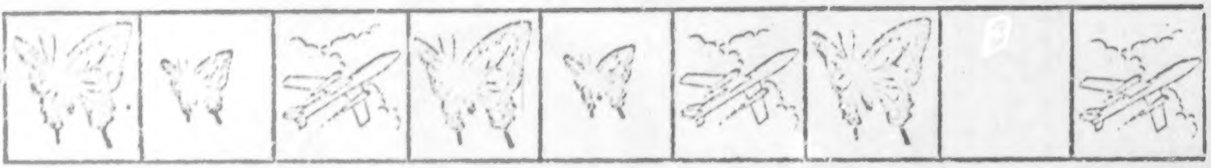

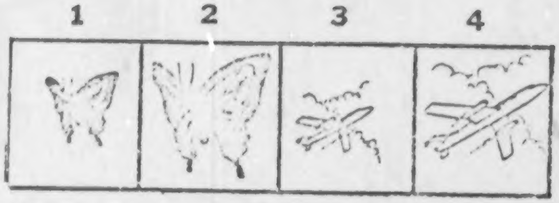

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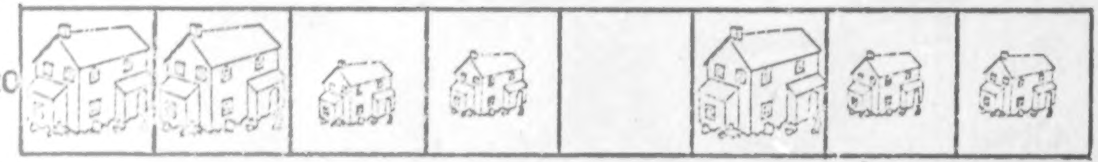

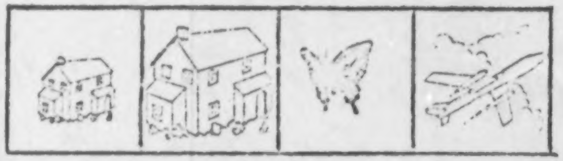

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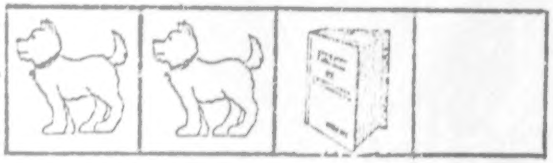

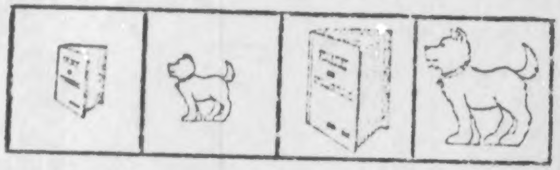

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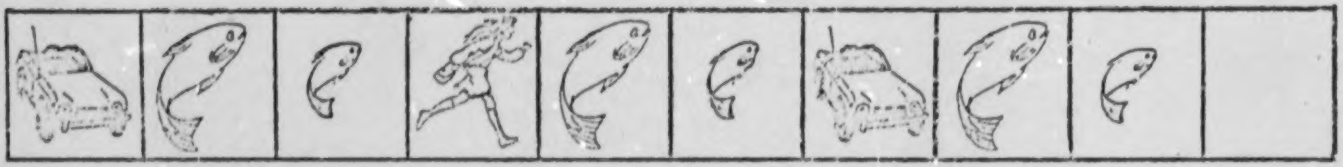

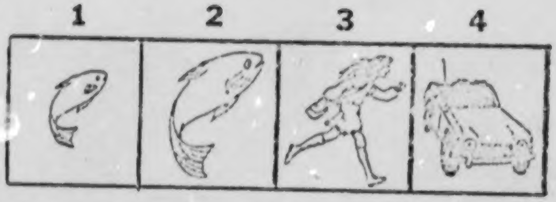

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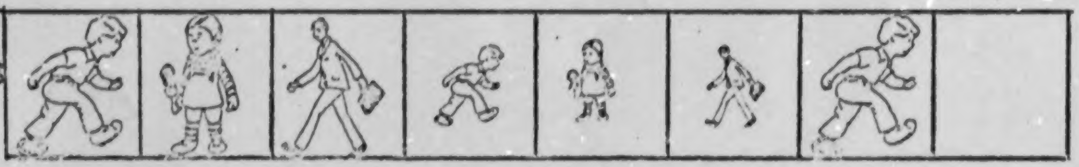

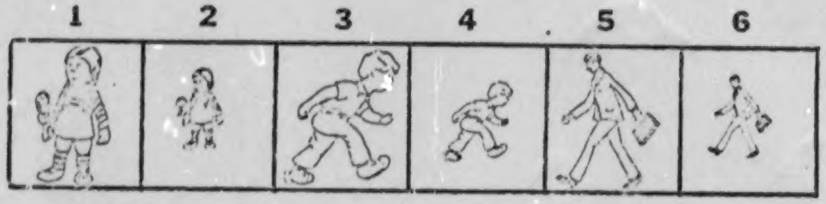

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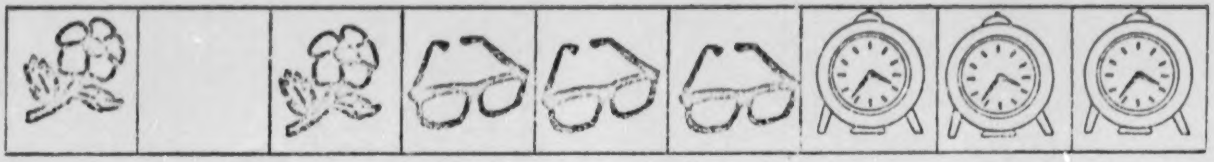

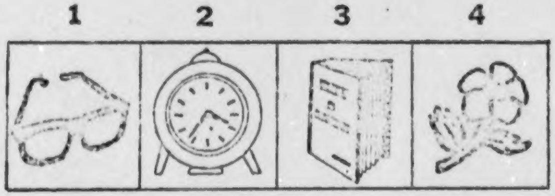

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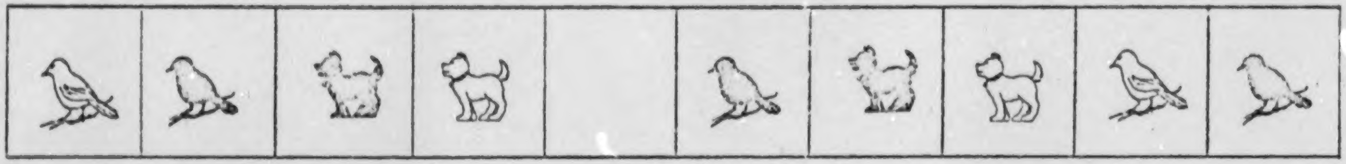

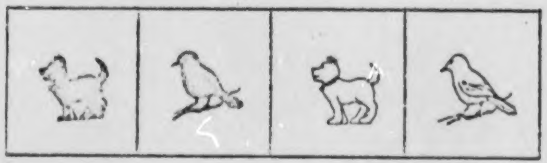

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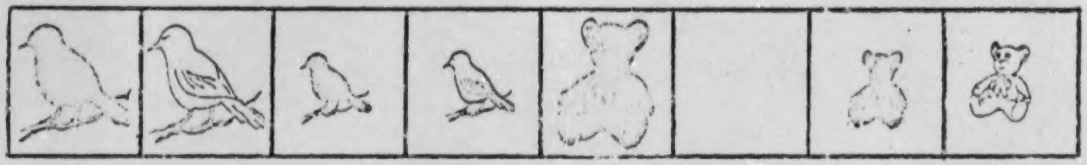

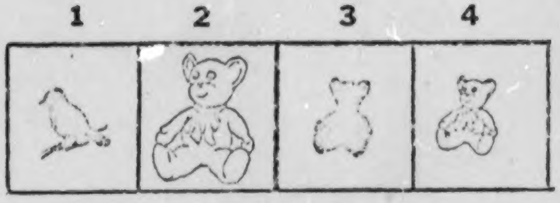

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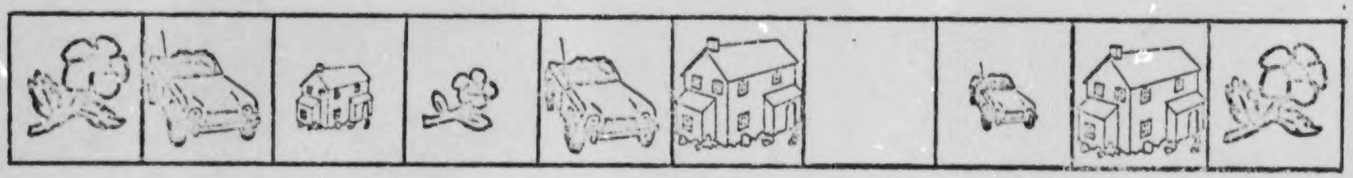

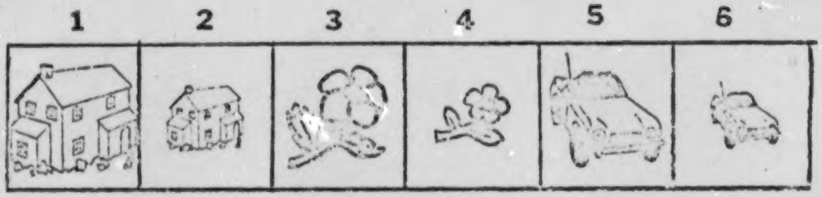

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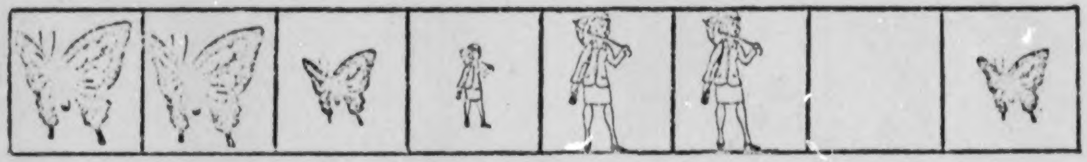

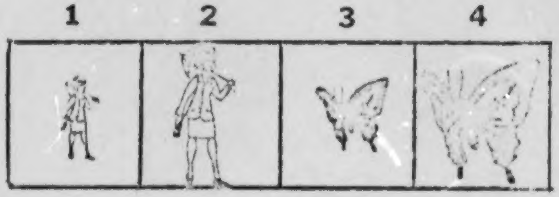

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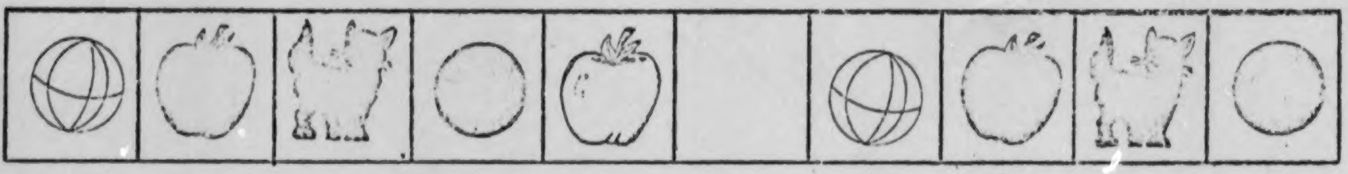

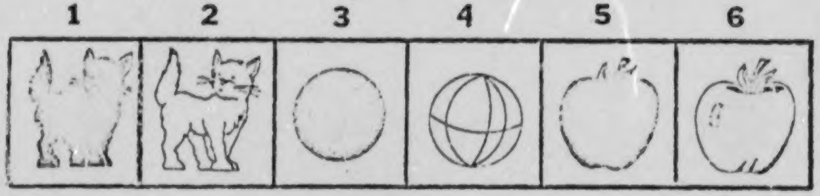

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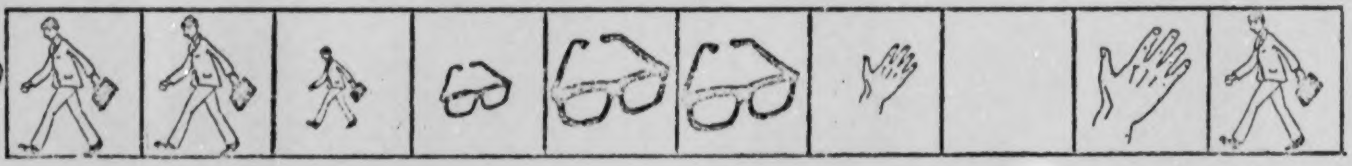

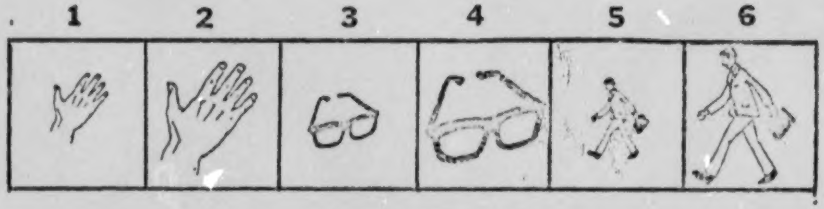

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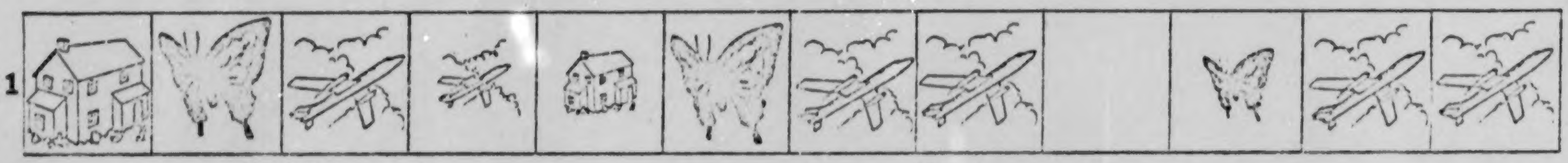

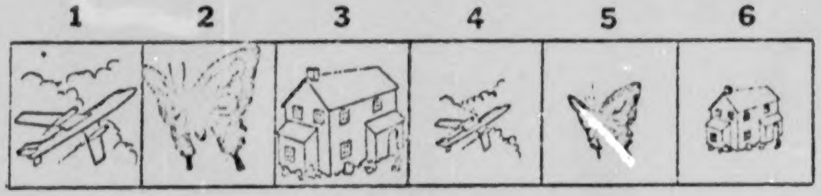

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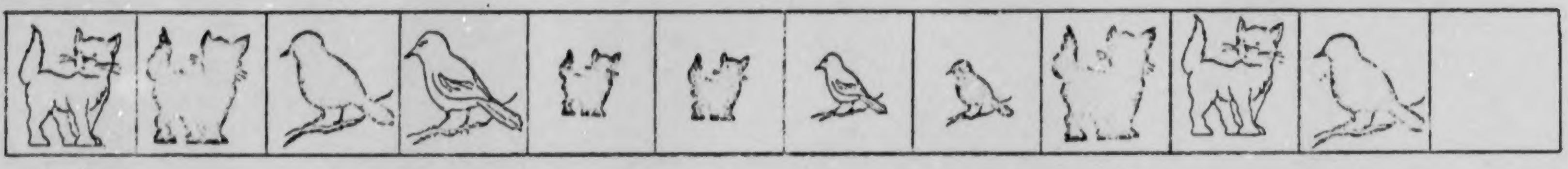
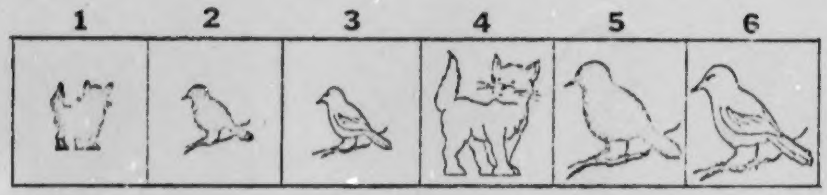
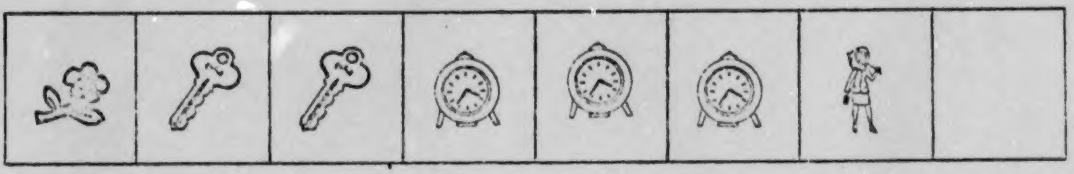
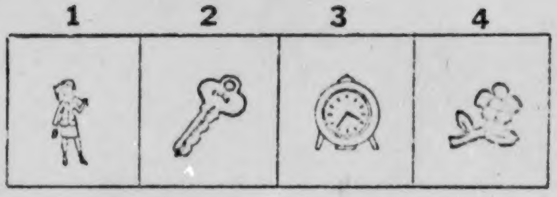
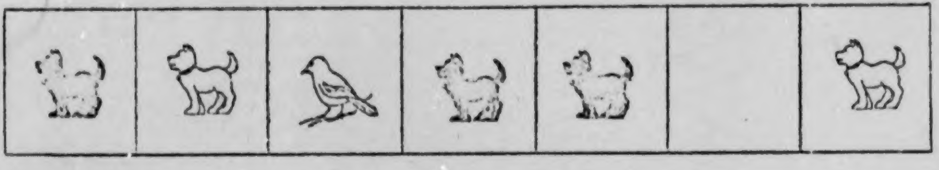
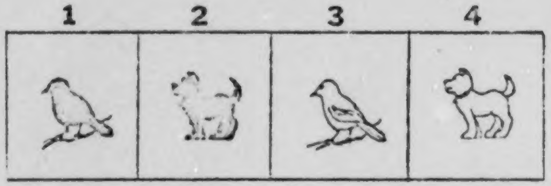


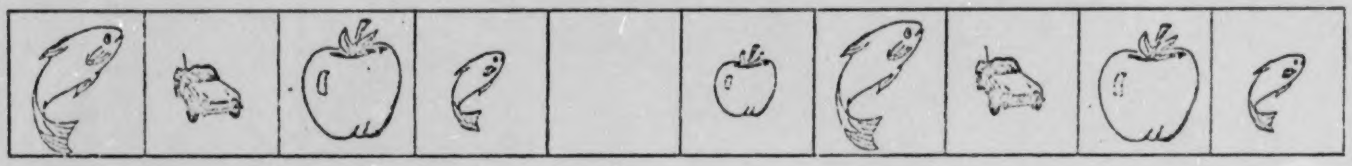


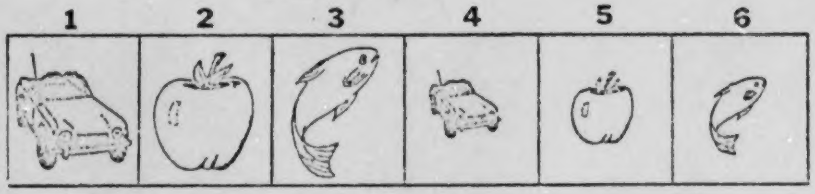
33 



34 



35 



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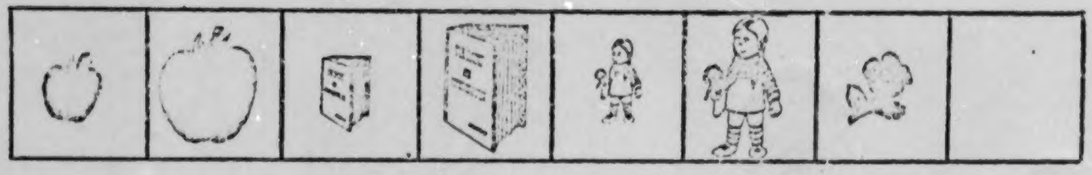

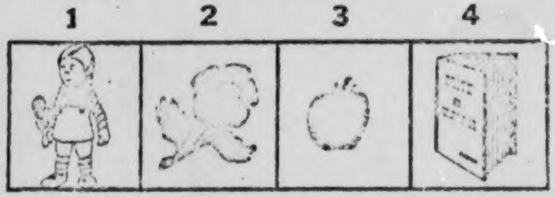

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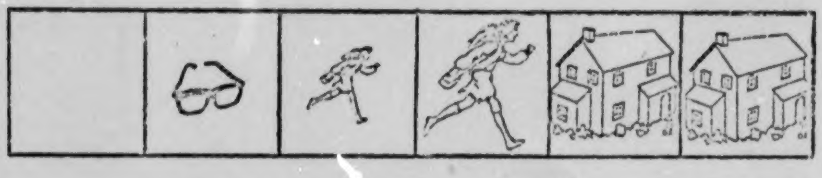

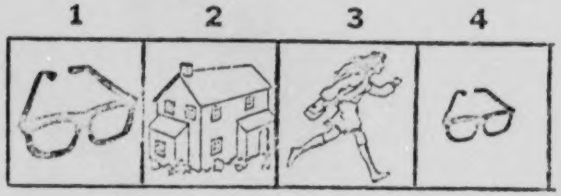

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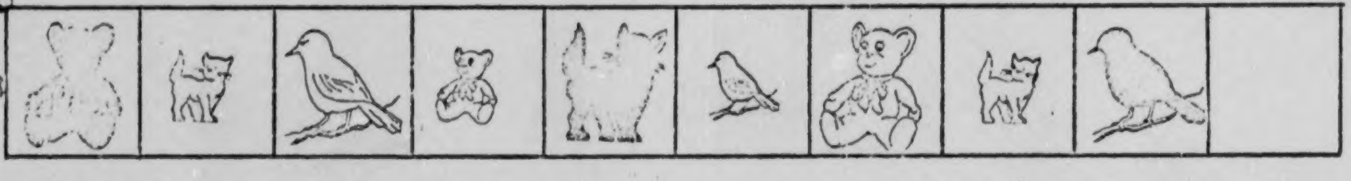

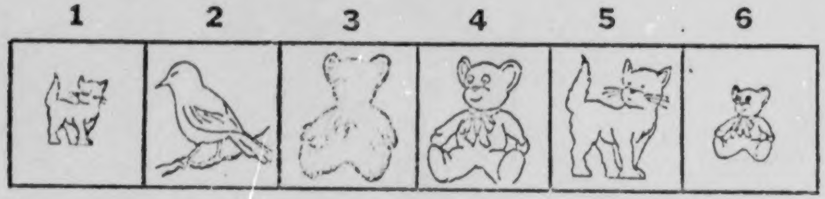

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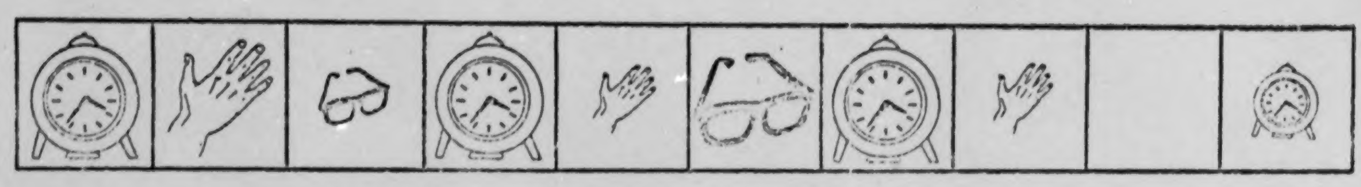

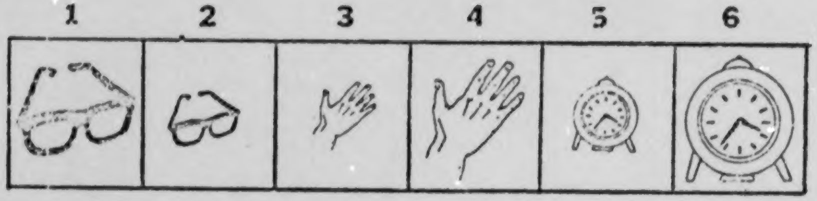

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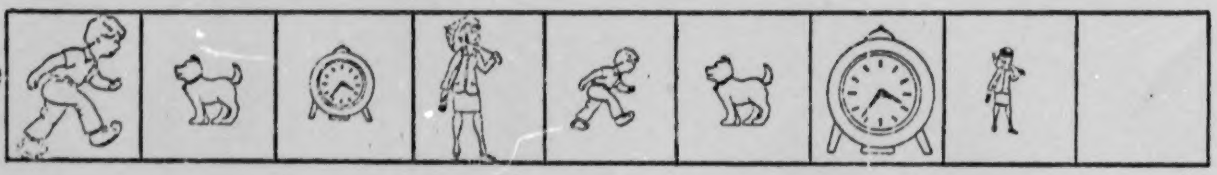

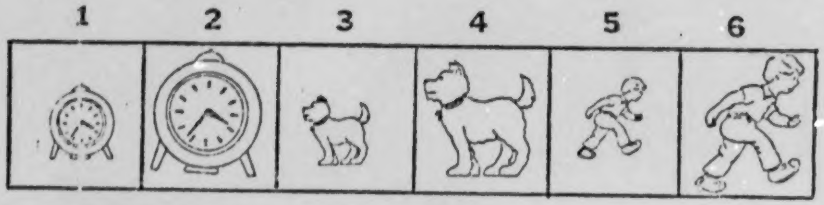

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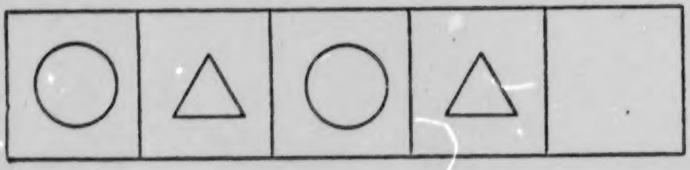
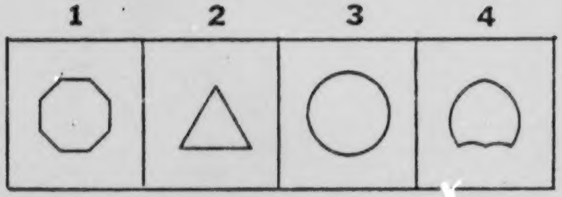

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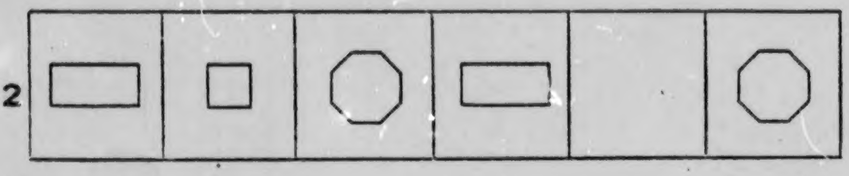
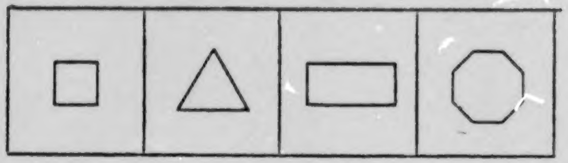

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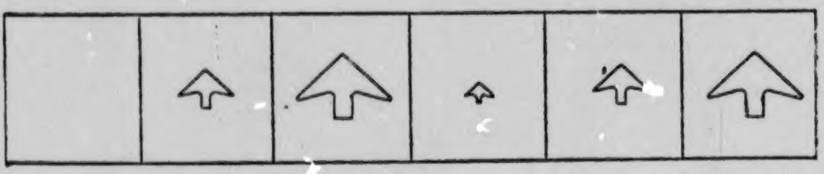
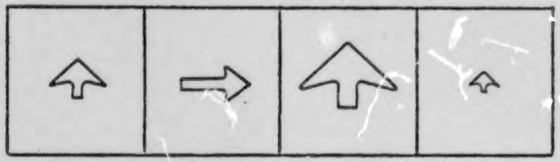

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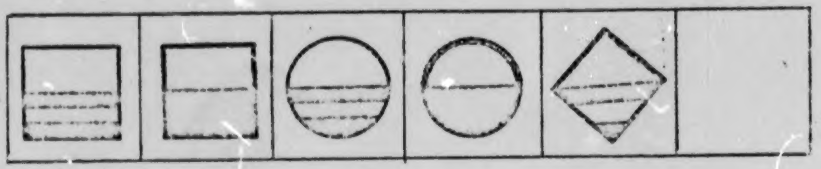
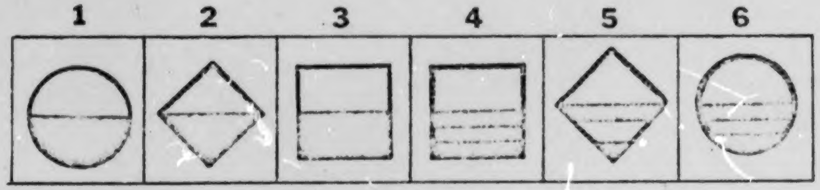

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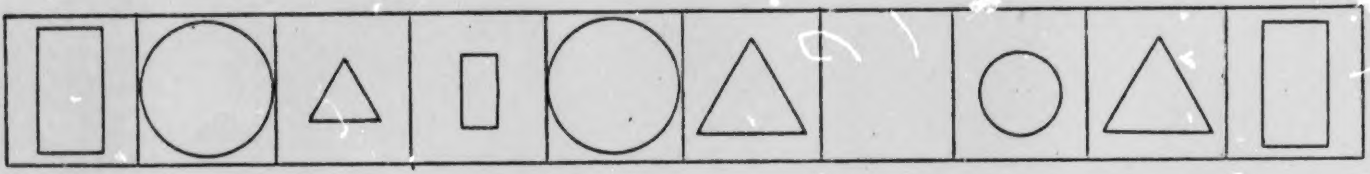

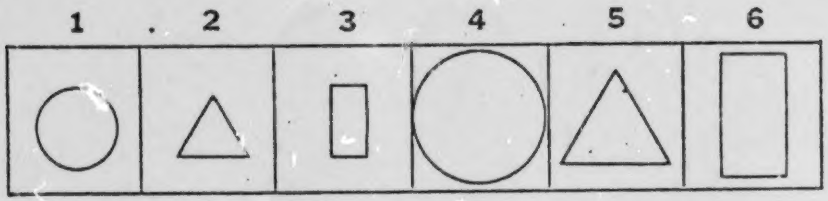

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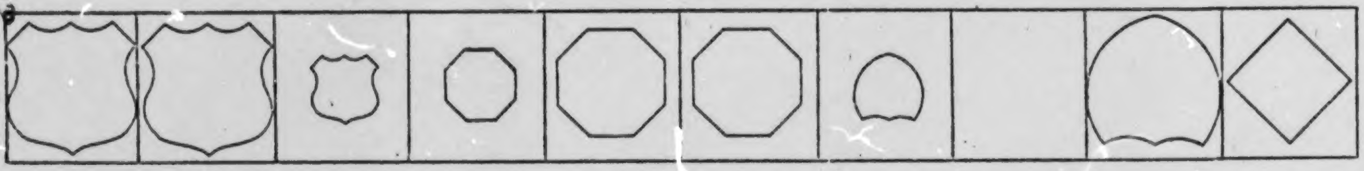

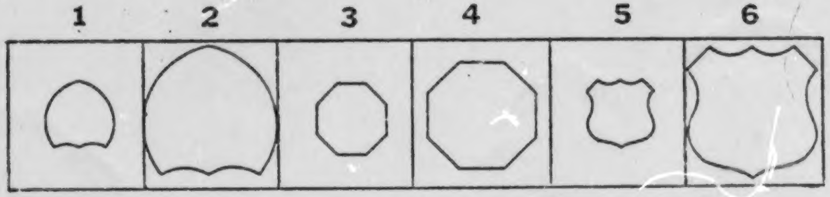

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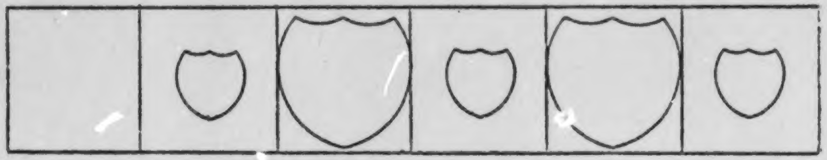

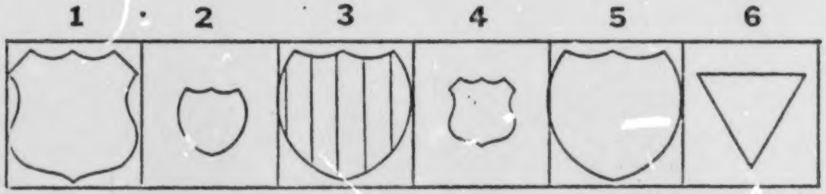

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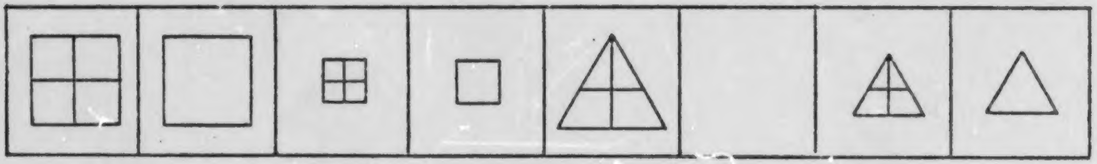

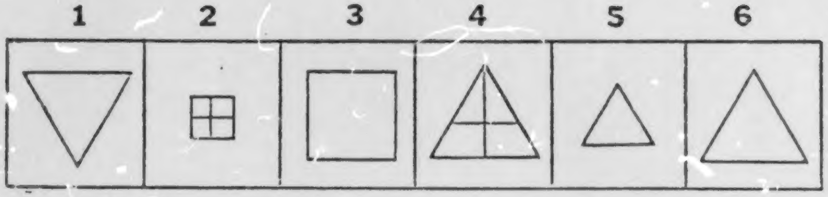

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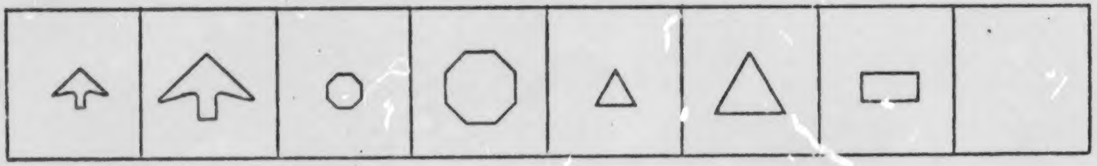
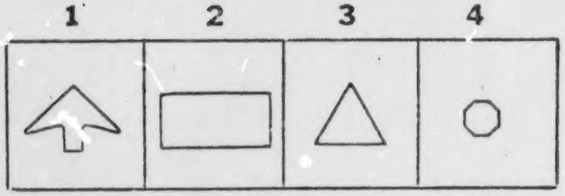

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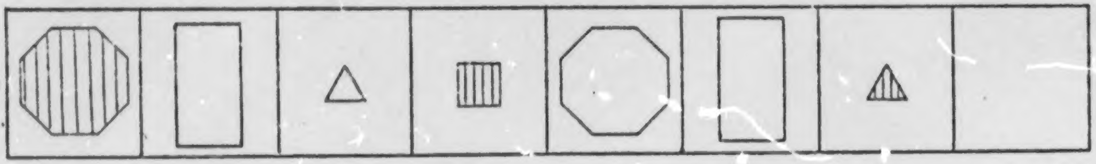
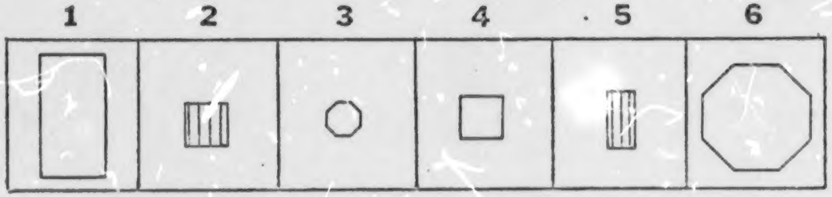

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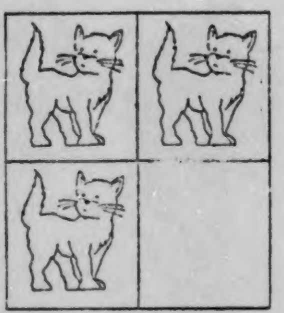

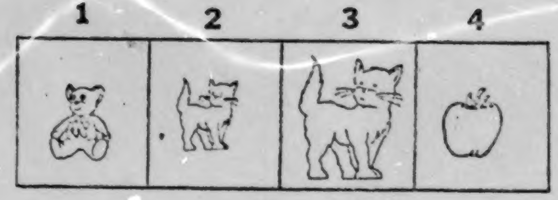

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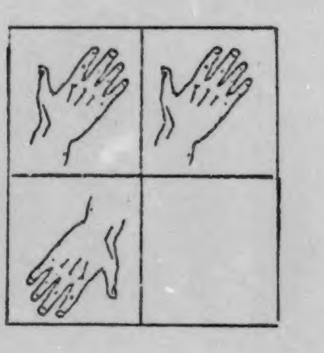

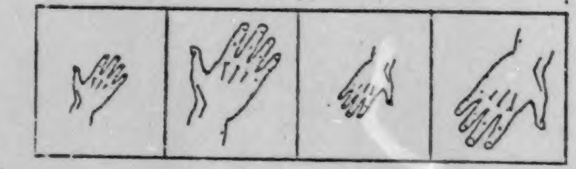

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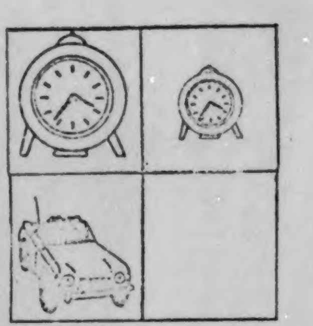

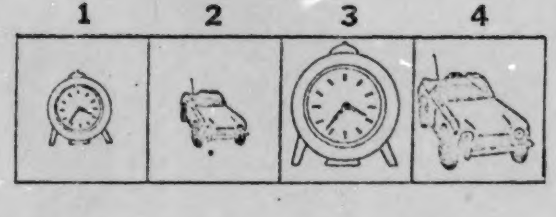

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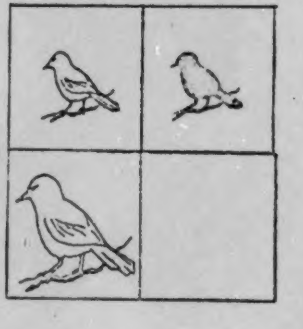

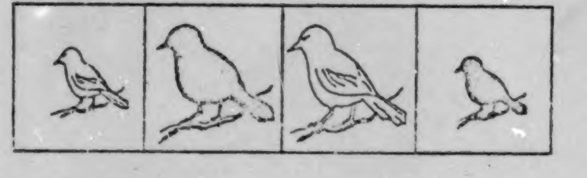

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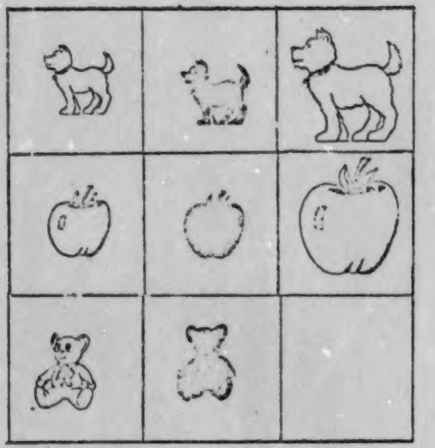

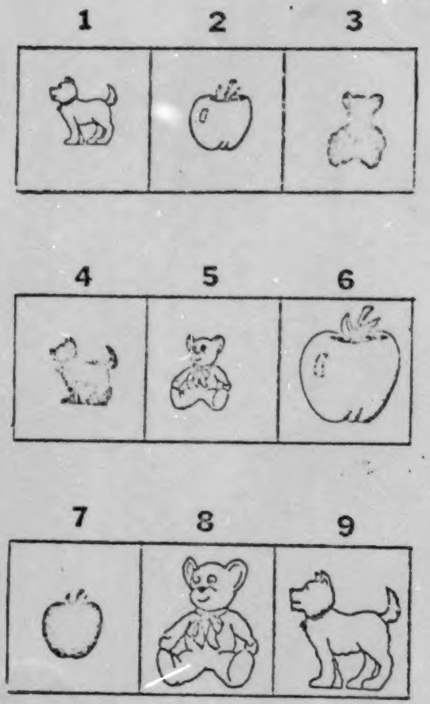

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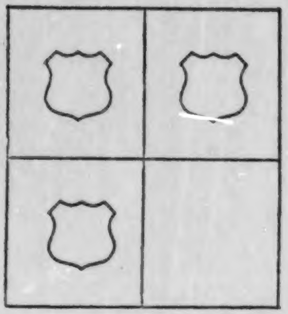

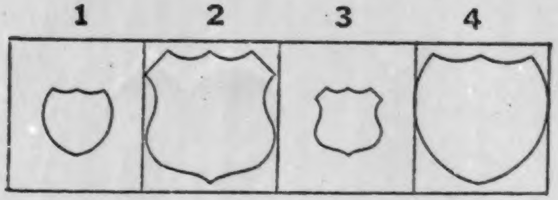

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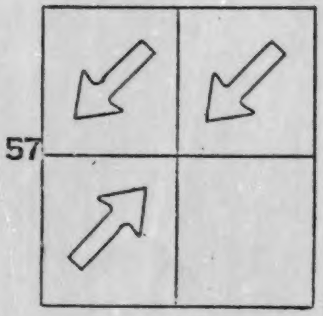

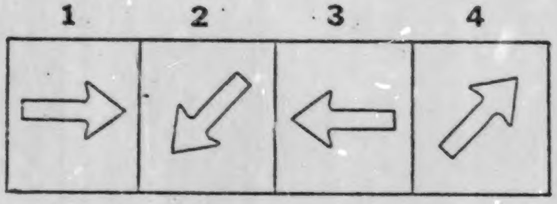

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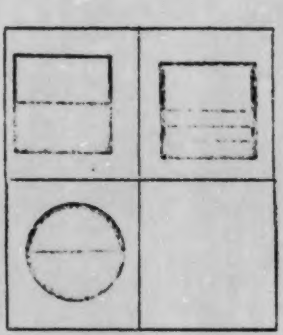

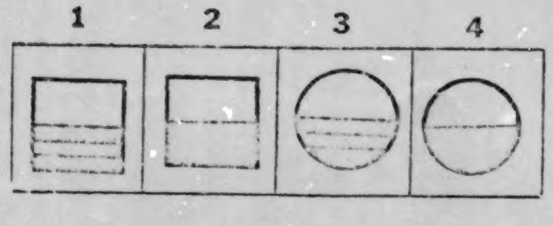

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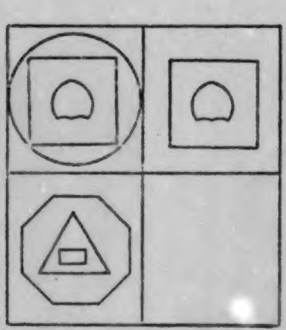

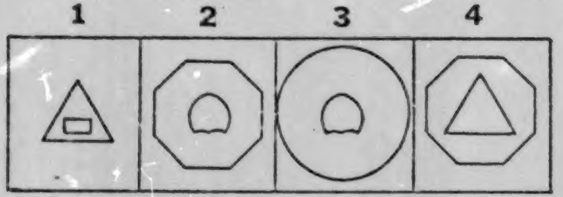

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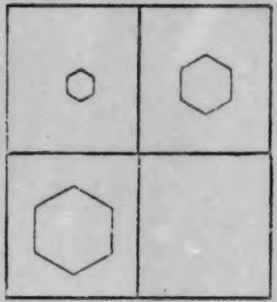

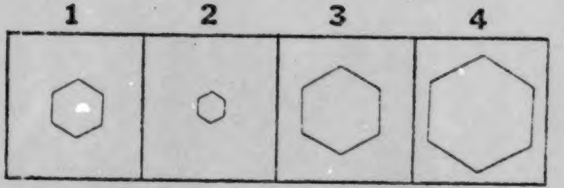

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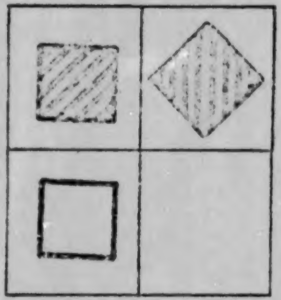

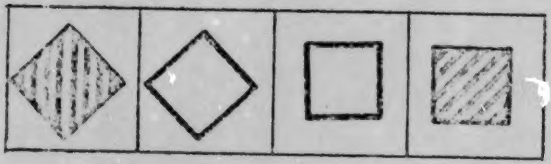

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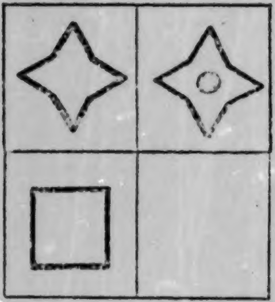

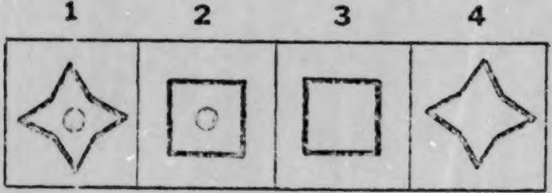

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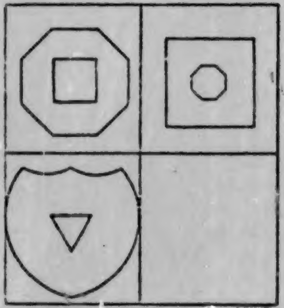

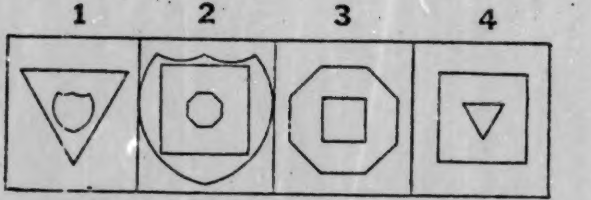

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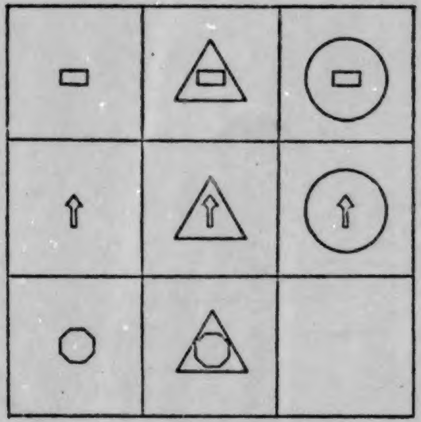

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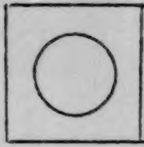

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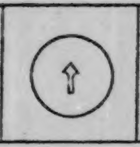

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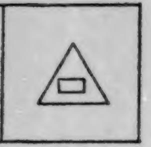

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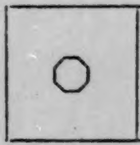

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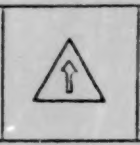

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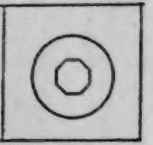

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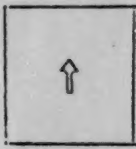

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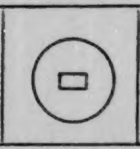

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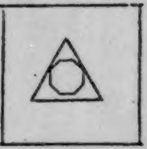

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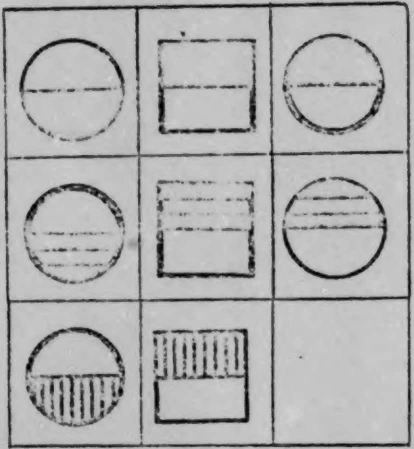

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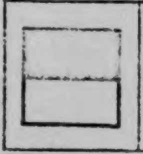

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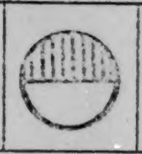

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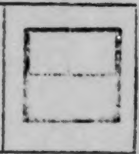

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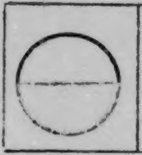

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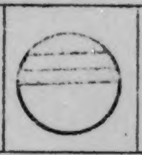

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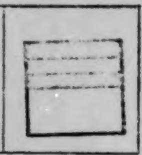

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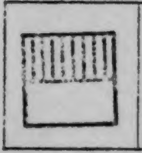

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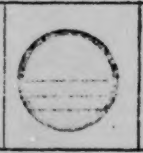

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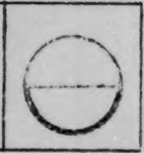

TRICKS FOR THE SERIES GAME

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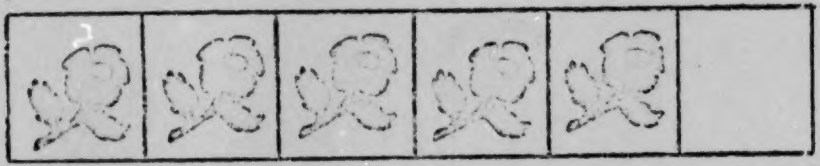

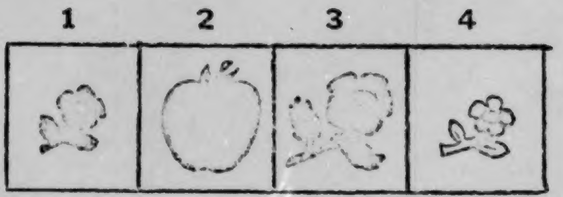

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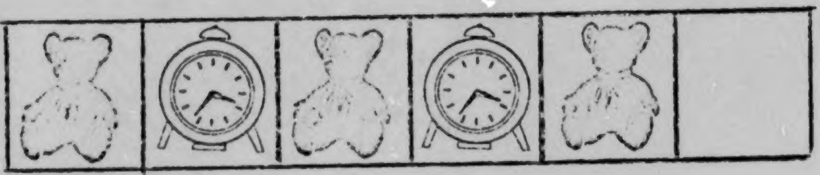

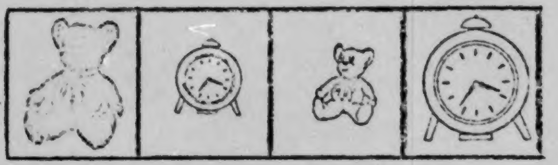

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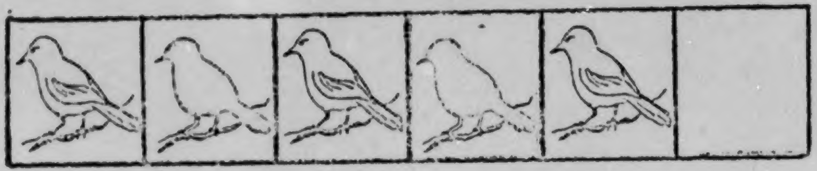

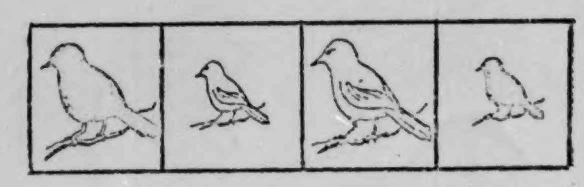

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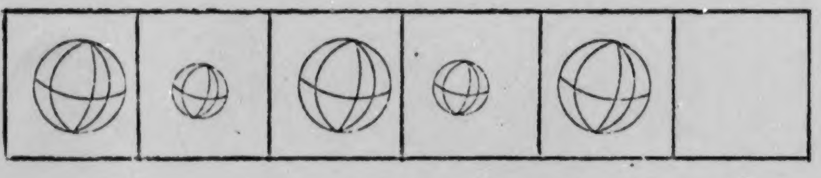

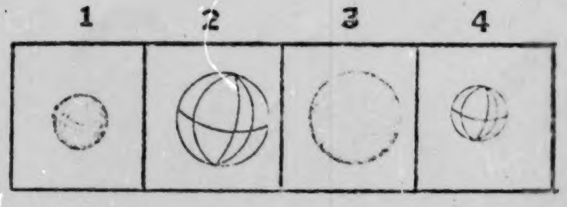

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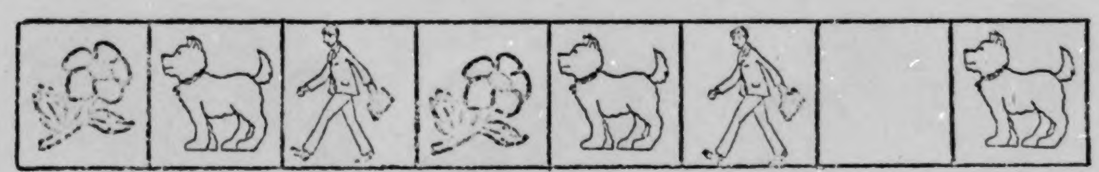

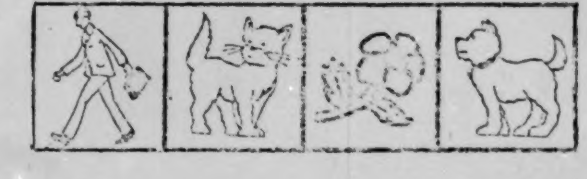

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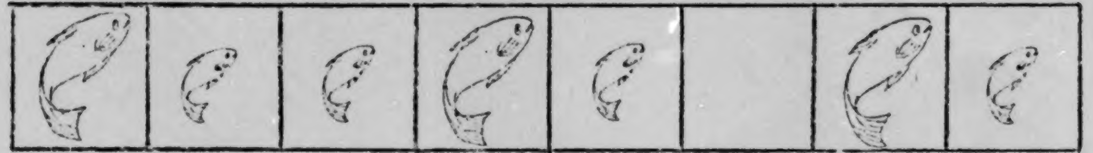

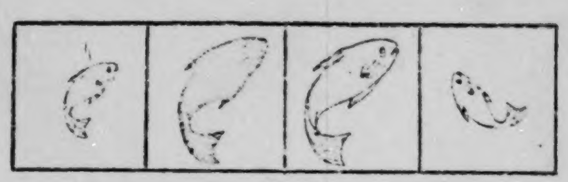

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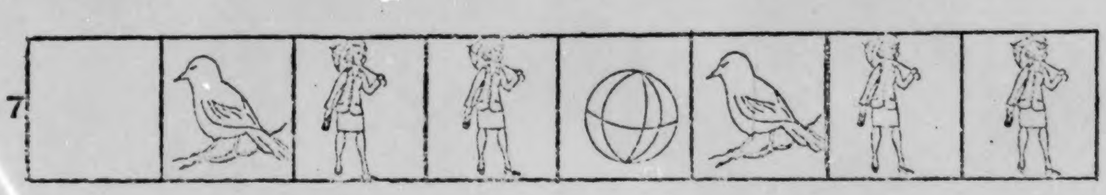

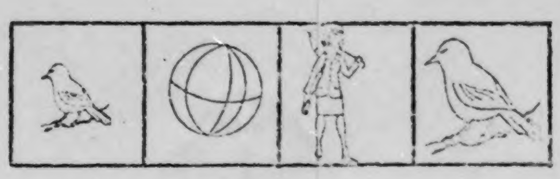

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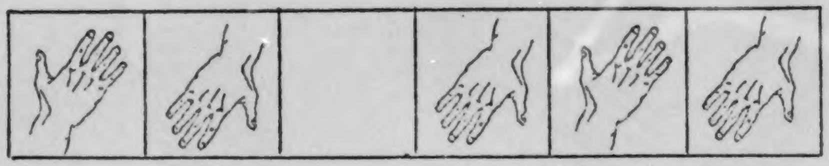

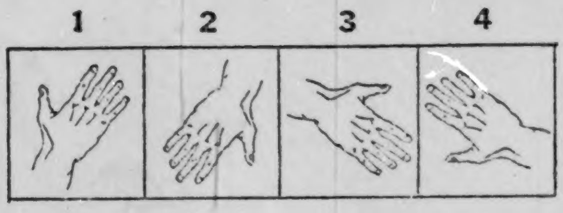

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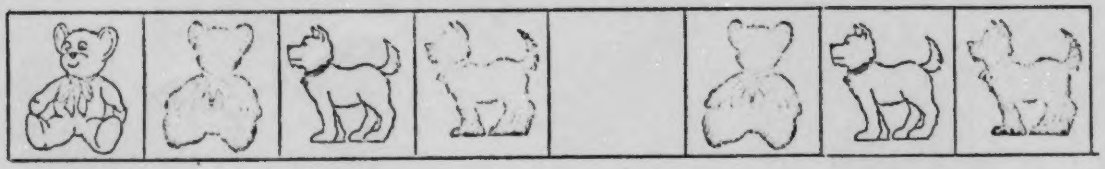

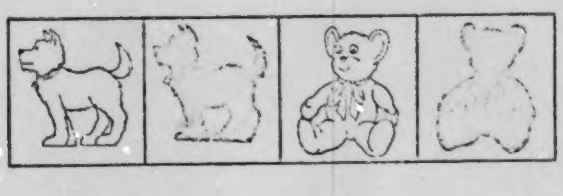

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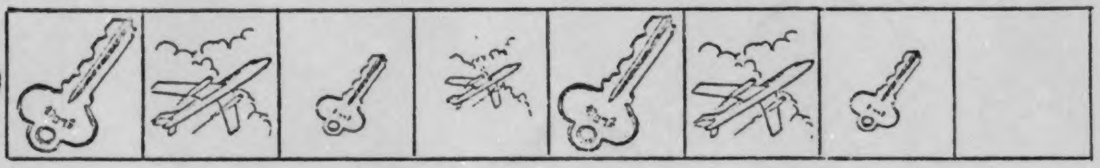

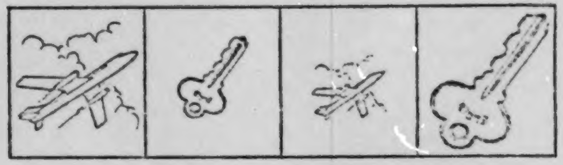

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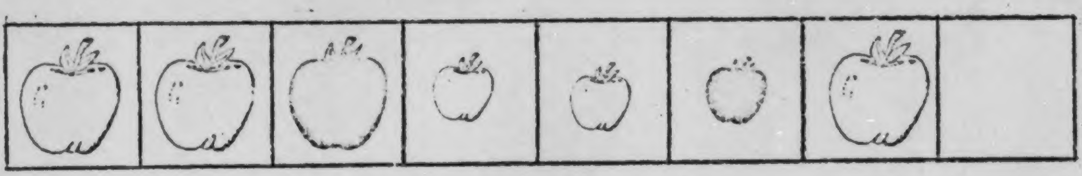

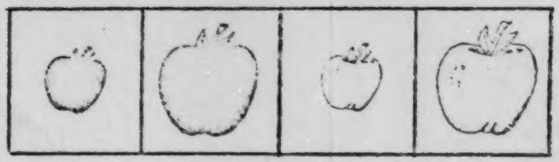

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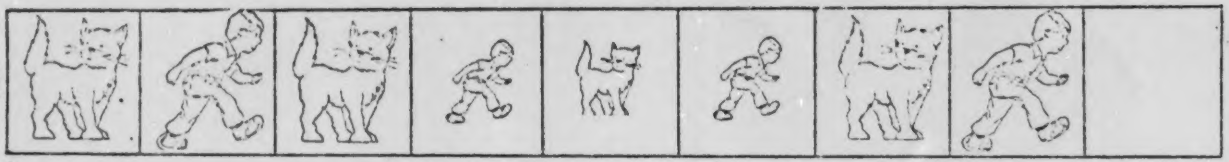

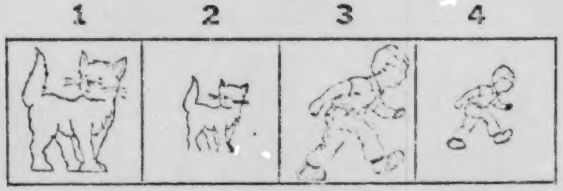

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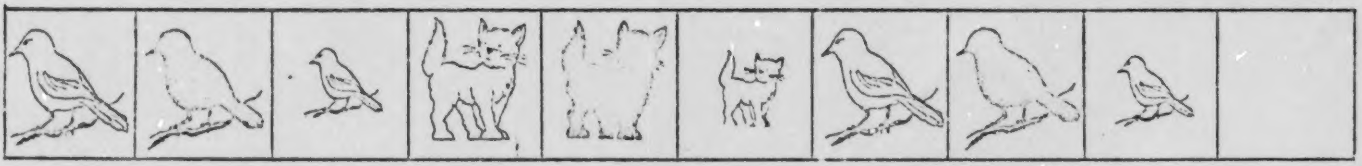

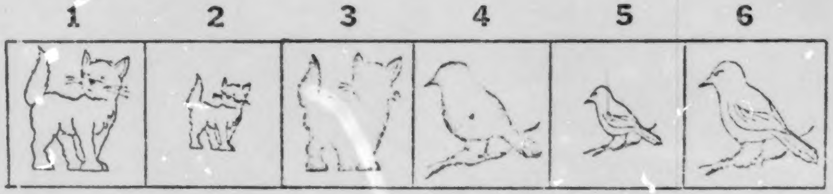

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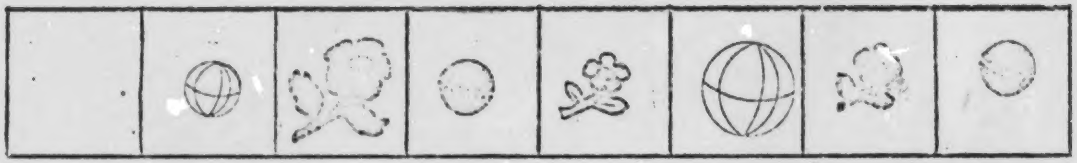

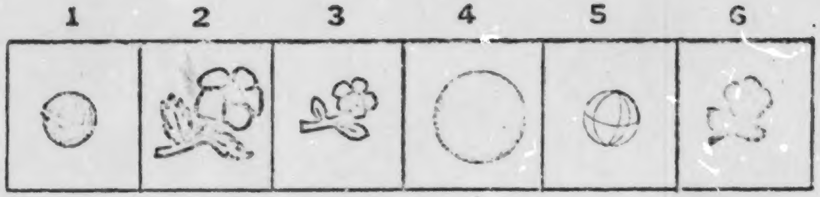

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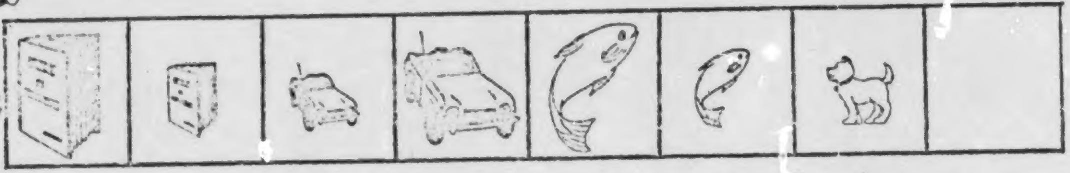

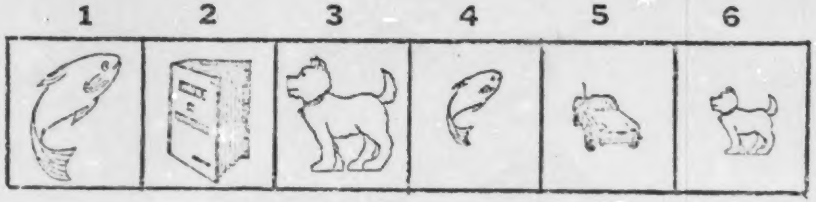

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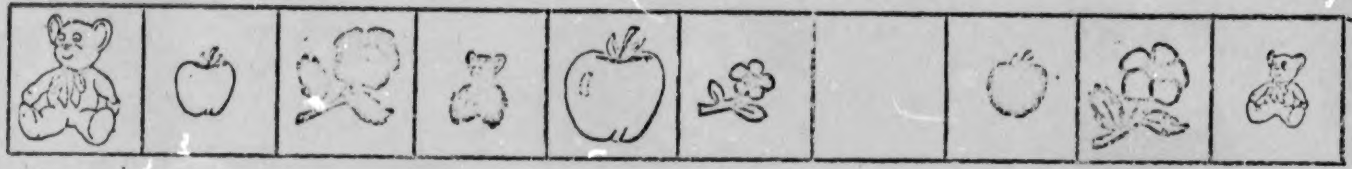

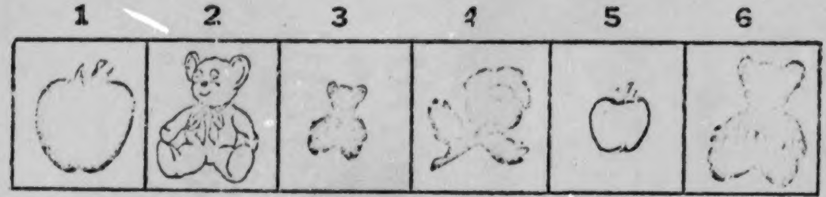

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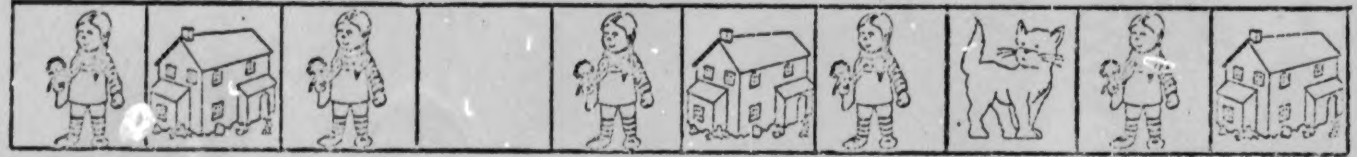
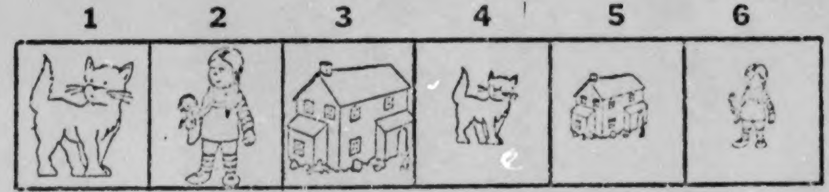




Instructions for Administration of the Series Learning Potential Test

For successful administration of the Series Learning Potential Test, the examiner must arouse the curiosity and involvement of the subjects simultaneously by creating a relaxed atmosphere in which the challenge is non-threatening to the children. The test (called "The Series Game") lends itself well to these requirements due to its game-like nature. The coaching session is an opportunity for loose, active involvement, while the post-test is an opportunity for a more relaxed second effort at the task.

The Series Learning Potential Test is administered in three separate sessions - the pre-test is administered on the first day, the coaching on a second day, and the post-test on a third day (within three days, or within the range of a week for the cycle of testing). The schedule of these sessions should not interfere with "popular" activities such as gym and art. In the case of younger groups (ages 7 - 9) it is recommended that the sessions be held early in the day. The test should be given in a room free of distractions, and the children should be seated so they can watch the examiner. Also, there should be enough space for the examiner to walk among the subjects. The optimal size of the group is between 8 and 15 subjects. An experienced tester can sometimes manage a group of 25 to 30 children. With young children, it is highly recommended to have no more than 10 - 12 subjects in the group. When testing large groups (if this is unavoidable) the tester should be assisted by a person who is familiar with the Learning Potential measurement in all three parts of the testing. The test user should try to test the group in their usual classroom and to have the teacher present (even though she need not participate in the administration).

With the setting arranged, it's up to the examiner to make the situation interesting and relaxed. The examiner should explain to the subjects what to expect in each session. The terminology should be simple, referring to test items as puzzles and to the coaching as the "game of learning tricks" for greater enjoyment the second time around. We recommend that the tester should try to pick up the names of the children early in the session.

During the testing, the examiner should walk around the room to make sure instructions are understood and followed. Occasionally the tester should reinforce individual children by saying "good" or "that's right" or give individual attention to children who seem to be nervous or have difficulties, i.e., repeat test instructions. It is probably better to exclude resistant and/or hyperactive children than making them take the test in an orderly way against their will.

Specific Instructions

Pre-Test Instructions

Once all the subjects have settled down with erasers and sharpened pencils, the examiner makes her introductory remarks. These comments refer to the test items as puzzles or games, and emphasize that the subjects will later be shown tricks which enable them to play the game better a second time. These comments could be flexibly changed to suit the group addressed.

"Today you're going to do the puzzles in the Series Game book (indicate pre-test booklet). First you will do them on your own, and later I'll show you tricks you can use for solving the puzzles. The next time I come you'll work on puzzles like these again on your own, so you'll have a chance to use the tricks."

Pass out the test booklets and ask the subjects to fill in their first and last names, etc. Spell out the teacher's name on the blackboard and point to the appropriate lines on the face sheet as the subjects are writing. Walk around the room to see that the writing is legible and that both first and last names have been written. Return to the front of the room where all the subjects can see clearly. When all the children are ready, give the pre-test instructions, holding the test booklet up to demonstrate the directions.

You explain to the subjects the nature of the stimuli and the requirements of the task - to find the picture that belongs in the empty space, and circle it. Your instructions should clearly distinguish between the puzzle row (the series itself) and the answer options.

"Now turn to page one and look at the first row. What do you see? You see a series of pictures and an empty space. What you have to do is find the picture that belongs in the empty space. That picture is one of the pictures on this side of the page (right side). So this row on the left, is the puzzle (point) and these are the choices (point). Only one of these pictures fits in the empty space, and you must find which one is the best. Look at the pictures in the puzzle and ask yourself, 'What comes next, what fits in the empty space?' then look at the choices and circle the picture you think is the right answer. Which of the choices is the right answer for the first row? Is it number 1, 2, 3, or 4? (Point to each of the numbered choices). That's right, it's number 3. Put a circle around number three. (Walk around the room to be sure each child has done it correctly). Now you can do the rest of the book by yourselves the same way. Each row is a different puzzle which has a different answer. Look at the puzzle with the empty space, ask yourself what picture comes next and fits in the empty space. Then look at the choices and circle the right answer. Remember that there is only one right answer. Be sure not to skip a row."

The test lasts for 30 minutes or until all but one or two subjects have finished. During the test, walk around the room to be sure that the subjects circle only one answer, that they do not circle pictures in the series puzzle itself, and that they do not consistently circle the same position. You can repeat the instructions and reinforce children, but do not offer any information beyond what you have given in the initial instructions.

Coaching Instructions

The coaching session, administered to the entire tested group, provides "tricks" for approaching picture series problems. The group learns to approach, and solves together, seventeen items. The following principles are emphasized:

1. In each series "something changes," and one must identify the change in characteristic (e.g., changes in object, size, color, etc.).
2. The change in every series has a "tune," or "rhythm." One

must discover the tune and be able to sing it to himself. Using the tune, one can go beyond the pictures in the series.

3. Most series have more than one "tune;" one must first identify the different "tunes," and then sing each separately. Each isolated "tune" will include only one change dimension.

4. For every "tune"one sings, he can cross out those choices which are incorrect for that tune. The remaining uncrossed choices can help decide which "tune" to sing next.

5. "Tunes" must not start at the beginning of the series, and they can be sung in any direction.

In short, the tester coaches the subjects to identify the concepts (color, size, object, etc.) which change in a series using their sense of rhythm, to isolate the concepts by separating the tunes, and to eliminate wrong choices for each step. Emphasize the point of looking to see what changes - of saying a separate tune for each thing that changes.

The coaching session should be carried out as a group experience that involves all subjects. Distribute the booklet entitled "Tricks for the Series Game." Inform the children about it and ask them not to proceed ahead of the group. The coaching is carried out much as a regular lesson, and the children should be encouraged to "sing the tunes" together. At the same time, you should call on individuals (active and passive, bright and less bright) to lead the class in identifying and singing the tunes.

A set of complete instructions for the coaching booklet follows. With slower groups, the instructions should be followed to the letter. With other groups, the tester should use his judgment to determine the amount of repetition. "Repetition" refers mostly to the number of times the same tune is repeated. If the group shows signs of boredom and most subjects seem to catch on to the strategies, the tester should skip a few items, e.g., numbers 13, 14 or 15. In any case, the last item should be included in coaching as it shows the use of starting the tune at the end of the series.

Instructions for Coaching

"In the booklet that you just completed, you saw rows of pictures with an empty space in each rown. You had to find the picture that fits the empty space and completed the series and then circle it. Now we will go through this booklet together and I will show you some tricks that will help you find the right answer for each row. If you use these tricks, the problems will be very easy. Look at the first row in "Tricks for the Series Game." What do you see? (Tester should encourage a group response here and in the following problems but at the same time should also learn some of the subjects' names and call on specific individuals at times. The subjects must answer with the coacher and not go be ond the example with which the coacher is dealing. The use of the strategies must be enforced in this way.) That's right, a row of flowers. Now let's look at the same row again and as we look we can say what each picture is (point to each picture as you go along saying the name of the picture aloud) flower, flower, flower, flower, flower, flower. We can say that the tune is flower, flower, flower, flower, flower, flower. (Go through the series saying the tune aloud with the subjects once more and when you reach the empty space ask what goes here.) Let's repeat the tune of the row once together (this time continue the tune to automatically extend beyond the empty space). So now we see that flower fits in the empty space. Now look at the choices on the other side. We know it can't be number 2 because that's an apple. Cross it out. (Tester should walk between aisles to make sure everyone gets the idea of crossing out the wrong answers.) Is it number 1? No. Why? That's right, it's too small. Cross out number 1. What's left? The big black flower and the small white flower. Which one is the right answer? That's right, number 3 is the right answer. Circle it.

"Now look at row number 2. What do you see? Yes, there are teddy bears and clocks, two different kinds of pictures. Let's go through the row and say the tune. Teddy bear, clock, teddy bear, clock, teddy bear, clock. (To the coacher: do you feel the tune? Tune must be read rhythmically to catch the class's interest.) Once more, teddy bear, clock, teddy bear, clock, teddy bear, what goes here? That's right - clock. Now look at the choices. Since we know the right answer is a clock which answers do we know are wrong? Yes, we know that number 1 and 3 can't be right because they're both teddy bears, so cross them out. What's left? The small clock and the big clock. Is it number 2? No. Why? It's too small. Cross out number 2. Now what's left? The big clock, number 4. This is the right answer so circle it. (Be sure the children pick up the rhythm. You might move your hands in time to the rhythm as you say the series out loud with the kids. Coacher should emphasize questioning the class but at the same time should call on individuals whose attention might be wandering. Coaching must be made exciting but must not move so quickly that the slower children are lost.)

"In the next few problems I will show you that there are different kinds of tunes which we must look for in the rows. We have just seen that the picture can change from teddy bears to clocks. In row number 3 we see a different kind of change. Can someone tell me what changes here? That's right, the color changes from black to white. Does the picture change? No. All the pictures are birds so we are just going to forget about the pictures and look at the color tune. Remember we done't say bird each time, we just say the color. (Tester should make sure everyone just says color to avoid confusion later on when more than one tune are present.) Let's say the color tune. White, black, white, black, white, black. (Tester should always continue the tune beyond the empty space.) Again. White, black, white, black, white, what comes next? That's right - black. Black is the right answer so which of the choices can we cross out? Number 2 and 3 - because they're white. What's left? The big black bird and the small black bird. Which is the right answer? Number 1 is the right answer because all the birds are big. Cross out number 4 then and circle number 1.

"Turn the page. Now let's look at row 4. What do you see? You see a row of balls, so we know the picture doesn't change. What changes? That's right - size. The balls are big and small. Does color change? No. Now let's read through the row and say the size tune. Remember we don't have to say ball each time because we're just looking at the size tune. Big, small, big, small, big, small.

(Tester should always continue the tune beyond the empty space.) One more time. Big, small, big, small, big, what comes next? Small. Now let's look at the choices. We know that the answer has to be small so which ones can we cross out? That's right - we can cross out numbers 2 and 3 because they're both big. What's left? The small black ball and the small white ball. Which is the right answer? That's right. The small white ball because all the balls are white, so cross out number 1 and circle number 4.

"What do you see in row number 5? Yes, there are pictures of a flower, a dog and a man. We've seen rows with one kind of picture and rows with two kinds of pictures. Now there are three kinds of pictures in this row. Does the color change? No. Does the size change? No. Something else is different. Can someone tell me what it is? Yes, the empty space comes in the middle of the line and not at the end. This makes the problem a little harder but we use the same tricks. Let's read the tune together. Flower, dog, man, flower, dog, man, flower, dog, man. Again. Flower, dog, man, flower, dog, man, what comes next? That's right - a flower. Let's look at the choices. We know that a flower is the right answer so what can we cross out? Yes, we can cross out everything except the flower, number 3, the correct answer. Now circle the flower. Now let's review. What are the things that can change? That's right. Color, size, picure. That means there can be three separage tunes.

"Let's look at row 6. What changes? Size. Does anything else change? No. Let's read the size tune. Big, small, small, big, small, small, big, small, small. (Even if the written series is not complete, tester should always read a complete tune.) One more. Big, small, small, big, small, what comes next? That's right - small. Look at the choices. What can we cross out? We can cross out number 2 and 3 because they're both big. Now which answer is the correct one? Number 1 is right. Why not 4? It's facing the wrong direction. Circle number 1.

"What changes in row number 7? That's right - the pictures change. Does color change? No. Does size change? No. Where's the empty space this time? That's right, the empty space comes in the beginning. Here's the trick when the empty space comes first.

Start at the end of the row instead of at the beginning when we read the tune. Let's read the tune together going from the end. Lady, lady, bird, ball, lady, lady, bird, ball. Again. Lady, lady, bird, ball, lady, lady, bird, what comes next? That's right - ball. Ball is the right answer. Let's look at the choices. Which ones can we cross out? We can cross out number 1 and 4 because they're birds and number 3 because that 's a lady. What's left? Ball. Put a circle around number 2. That's the correct answer - ball.

"Now let's look at row number 8 and see what changes here. Can someone tell me what changes? Yes, the position changes. Some hands go up and some go down. Does anything else change? No. Then let's go through the row reading the tune for position and saying only up or down for each picture. OK, the first one goes up so we say up, down, up, down, up, down. Let's go through the series once more. Up, down, up, down, up, down. What fits in the empty space? That's right - we need an up. Now look at the choices. Which ones can we cross out? Yes, cross out 2 and 3 because they go down. Now, which is the right answer? Yes, 1 is the right answer so cross out number 4 and circle number 1. Why is 4 wrong? That's right - it's facing the wrong way.

"Now we see that there are a number of things that can change in a row: the size, the picture, and the color and position. (in the following rows in which there are more than one of these tunes, the coacher should always stress that he prefers the subjects to start with color, size, or position and end with picture. Thus the subjects will learn to look for all tunes and not stop after reading the most obvious - the picture tune.) In row 9 we are going to see that sometimes more than one thing changes in a row which means we have to look for more than one tune in the row. For example, things can be black and white and also big and small, so now we will look at each kind of change separately and then it will be easy to find out what the right answer is. Now when we look at a series we will find all the kinds of changes there are and then we will look at each one separately. Look in row number 9. What kinds of changes do you see? That's right, the kinds of pictures change. There are teddy bears and dogs. What else changes? Yes, the color changes from black to white. Does anything else change? No. Let's just look at the color change first. Can someone read the tune for color? White, black, white, black, white, black, white, black. Again. White, black, white, black, what comes next? Yes, white. Now let's look at the choices. Which ones can we cross out? Yes, we can cross out numbers 2 and 4 because they are black. What's left? A dog and a teddy bear. Now let's go back and read the picture tune so we can choose the right answer. Teddy bear, teddy bear, dog, dog, teddy bear, teddy bear, dog, dog. Once more. Teddy-bear, teddy bear, dog, dog, what comes next? That's right - teddy bear. Now look at the choices. Cross out the dog and circle the right answer, the teddy bear.

"Now look at row number 10. What kinds of changes do you see? That's right - the pictures change from keys to planes. What else changes? The size. Does anything else change? No. Let's look at the size tune first. Big, big, small, small, big, big, small, small. Once more. Big, big, small, small, big, big, small, what comes next? That's right - small. Now look at the choices and what can we cross out? Yes, we can cross out numbers 1 and 4 because they're big and we want a small for the empty space. What's left? A key and a plane. Now we must go back and read the tune for pictures to decide between the key and the plane. Key, plane, key, plane, key, plane, key, plane. Again. Key, plane, key, plane, key, plane, key, what comes next? That's right - a plane. Now we can cross out the key and circle number 3, the plane.

"Look at row number 11. What do you see? Apples. Does the picture change? No. What changes then? The size. What else? The color. Now let's look through the row saying the color tune. White, white, black, white, white, black,white, white, black. Let's read it once more. White, white, black, white, white, black, white, what comes next? Yes, white. Now look at the choices. We know that the right answer is white so which ones can we cross out? That's right - we can cross out numbers 1 and 2 because they're black. What's left? A big apple and a small apple. Now we must go back through the row once more to decide on the right answer. This time we will read the tune for size. Big, big, big, small, small, small, big, big, big. Once more, big, big, big, small, small, small, big, what comes next? Yes, big is right. Now we can cross out the small apple and circle the big apple, the correct answer.

"Now let's go to row 12. What changes here? Yes, the picture changes from cats to boys. What else changes? Yes. the size changes. Does the color change? No, they're all white. Does the position change? No. Then let's start with the tune for size. Can someone say the tune for size? (The coacher must constantly check the extent of participation and call on the inattentive ones. No one should be lost at this stage of the coaching.) Big, big, big, small, small, small, big, big, big. Again. Big, big, big, small, small, small, big, big, what comes next? That's right - big. Now look at the choices. Which ones can we cross out? That's right - cross out numbers 2 and 4 because they're small and we need a big. What's left? A cat and a boy. Now we must go back and read the tune for picture to decide on the correct answer. Cat, boy, cat, boy, cat, boy, cat, boy, cat. Again. Cat, boy, cat, boy, cat, boy, cat, boy, what comes next? That's right - a cat. So now we know that number 1, the large cat is the right answer. Circle number 1.

"Now look through row 13. Tell me what changes. That's right - the picture changes. There are birds and cats. What else changes? Color changes. There are whites and blacks. What else? That's right - size changes. Does anything else change? No. So in this row we can see that we have three different tunes that we must do separately. Now let's go through the row looking at the size first. Big, big, small, big, big, small, big, big, small, big, big, small. You see I say big and small without looking at what the picture is or what the color is. Then I will go back and look at each of those tunes separately. Let's say the size tune once more. Big, big, small, big, big, small, big, big, small, what comes next? That's right, big. Now look at the choices. Which ones can we cross out? Yes, we can cross out numbers 2 and 5 because they're small. Now let's go back through the row reading the tune for color. White, black, white, white, black, white, white, black, white,

white, black. Once more. White, black, white, white, black, white, white, black, white, what comes next? That's right - white. Now look at the choices and what other ones can we cross out? Yes, we can cross out numbers 3 and 4 because they're black. What's left? A cat and a bird. So now let's read the tune for pictures to decide on the right answer. Bird, bird, bird, cat, cat, cat, bird, bird, bird, cat, cat, cat. Again. Bird, bird, bird, cat, cat, cat, bird, bird, bird, what comes next? That's right, cat. So cross out the bird and circle the correct answer, the cat, number 1.

"Now let's look at row 14. When the blank is at the beginning, what trick do we use? That's right - we start at the other end. Now what are the different changes in row 14? Size changes. Color changes. Picture changes. That's right. Let's start with the color tune this time. Remember we are going to read each tune separately. Black, black, white, white, black, black, white, white. Again, black, black, white, white, black, black, white, what comes next White - that's right. Now let's look at the choices. Which ones can we cross out? Numbers 1, 3, and 6 because they're black and we need a white. Now let's go back and read the size tune. Small, small, big, small, small, big, small, small, big. Again. Small, small, big, small, small, big, small, what comes next? That's right - small. Now if we look at the choices again we see that we can cross out number 2 because we want a small and number 2 is big. Finally let's go back and read the picture tune. Ball, flower, ball, flower, ball, flower, ball, flower. Again. Ball, flower, ball, flower, ball, flower, ball, what comes next? Flower - that's right. Now let's look at the choices again. What's left? A ball and a flower. Which one is the correct answer? The small white flower, number 3 is the correct answer so cross out the small white ball and draw a circle around number 3.

"Now look at row 15. What changes in this row? The kinds of pictures change. There are books, cars, fish and dogs. What else changes? The size changes. Does anything else change? No. Now let's look through the row saying the tune for size only. Big, small, small, big, big, small, small, big, big. Again. Big, small, small, big, big, small, small, what comes next? Big is right. Look at the choices and tell me what we can cross out. Yes, we can cross out all the smalls, numbers 4, 5 and 6 because we need a big for the empty space. What's left? A fish, a dog and a book. Now we must go through the row once more reading the tune for pictures. Book, book, car, car, fish, fish, dog, dog. Again. Book, book, car, car, fish, fish, dog, what comes next? That's right - dog. Now we know that the right answer is a dog so we can cross out the fish and book and circle number 3, the big white dog.

"Turn to the last page and look at row number 16. What changes here? Pictures. Color. Size. Yes, that's right. So we know that there are three different tunes that we must do separately. Let's begin with the size tune. Big, small, big, small, big, small, big, small, big, small. Again. Big, small, big, small, big, small, what comes next? Big, that's right. Now let's look at the choices. Which ones can we cross out? Number 3 and 5 because they're small and we want a big. Now let's go back and read the color tune. White, white, black, black, white, white, black, black, white, white. Again. White, white, black, black, white, white, what comes next? That's right - black. Now which choices can we cross out? Number 2 can be crossed out because that's white. What's left? Apple, flower and a bear. Now we must read the picture tune to decide on the right answer. Bear, apple, flower, bear, apple flower, bear, apple, flower, bear, apple, flower. Again. Bear, apple, flower, bear, apple, flower, what comes next? Bear is correct. Now we can cross out the apple and the flower and circle the correct answer, number 6, the big, black bear.

"Let's look at the last row - number 17. What changes in this row? The kinds of pictures change. Does anything else change? That's right just the kinds of pictures change. So let's look through the row now at the pictures. We see that there are girls, houses, and cats. Three different kinds of pictures. Now let's look through the row and see how the tune sounds. (This last example is a particularly good row to ask an individual to do alone, especially if there is one child who thinks he understands all the strategies to a point of impatience with the tester. If the child makes a false start, suggest that he start from the other end and remind him that the tune contains *three* different pictures. When he says the tune correctly, repeat it with the whole class.) Girl, house, girl, cat, girl, house, girl, cat, girl, house, girl, cat. Let's say it once more together. Girl, house, girl, cat, girl, house, girl, cat, girl, house, girl, cat. What picture are we missing in the series? Cat is correct. Now if we look at the choices below, we can see that numbers 2, 3, 5 and 6 are wrong because we want a cat. Cross out numbers 2, 3, 5 and 6. Now we have a big cat and a small cat. Which is correct? That's right - number 1, the big cat is the right answer. It's the same size as the other cat in the row. Now you have seen that a row may contain a number of tunes and that if we use our tricks the problems are very easy to solve. When many things change, such as color, size and picture or position, we know we must look at each change separately and cross out the wrong answers for each tune. Then after we read all the tunes in a row, we can circle the right answer."

Post-Test Instructions

The Post-Test should be given within three days and no more than a week following the first session by the same tester. The session again lasts either 30 minutes or until all but one or two subjects have finished. Before the subjects start working the tester briefly summarizes the "tricks" they have learned in the previous session, encouraging the subjects to use them and expressing confidence in their improved ability. Do not test children who were absent in the first session.

Have all the children fill out the face sheet as they did in the pre-test session and open to the first page. "This book (indicate post-test booklet) is similar to the one you did before. Remember that you have to find the picture which belongs in the empty space and then put a circle around the choice you think is the right anser. This time, you should use all the tricks you learned the last time. Look for all the different things that change in the row: color, size, or picture. Then sing the tune for each change separately and cross out the wrong answers as you go along. Don't forget the trick of starting at the other end when the empty space comes at the beginning of the row. Remember to circle only one answer and not to skip any rows.

Scoring

The score is the number of items answered correctly. Use the scoring key and do not trust your judgment. Give credit only when one choice (the correct one) was circled. Occasionally a child may circle a picture in the series instead of the provided choices. Give credit if the choice is correct and the only one circled.

Record the scores on the face sheets of the pre-test and post-test booklets. The format is as follows:

AP (apple) Pre-Test

Series	
pict.	items 1-40
geo.	items 41-50
total	items 1-50
Matrices	
pict.	items 51-55
geo.	items 56-65
total	items 51-65
Total	items 1-65

TB (teddy bear) Post-Test

	TB	AP
Series		
pict.	items 1-40	1-40
geo.	items 41-50	41-50
total	items 1-50	1-50
Matrices		
pict.	items 51-55	51-55
geo.	items 56-65	56-65
Total	items 1-65	1-65

Scoring Key

ITEM	ANSWER	ITEM	ANSWER
1	3	34	3
2	2	35	1
3	1	36	2
4	4	37	4
5	2	38	6
6	3	39	1
7	3	40	5
8	1	41	3
9	4	42	1
10	1	43	4
11	2	44	2
12	4	45	3
13	2	46	1
14	2	47	5
15	4	48	6
16	3	49	2
17	4	50	4
18	1	51	3
19	1	52	4
20	2	53	2
21	3	54	2
22	3	55	8
23	1	56	3
24	4	57	4
25	4	58	3
26	2	59	1
27	4	60	4
28	3	61	2
29	2	62	2
30	1	63	1
31	6	64	6
32	5	65	2
33	1		

Instrucciones para la Administración de la Prueba Series de Potencial de Aprendizaje

Para una exitosa administración de la Prueba Series de Potencial de Aprendizaje, el examinador debe simultáneamente excitar la curiosidad y envolver a los sujetos (estudiantes) por medio del ambiente creado de tal forma la prueba no sea amenazante para los niños. La prueba en sí misma llena estos requisitos porque se parece a un juego. La sesión de adiestramiento es una oportunidad para que el niño se envuelva activa y despreocupadamente, mientras que la segunda administración de la prueba, después del adiestramiento, provee una oportunidad para una ejecución más tranquila.

La Prueba Series de Potencial de Aprendizaje se administra en tres sesiones - primera prueba (pretest) es administrada el primer día, el adiestramiento en el segundo día, y la segunda prueba (posttest) en el tercer día (tres días consecutivos o dentro de una semana para la administración total de la prueba). Deben tomarse todas las precauciones acostumbradas para la administración de pruebas en grupos.

Instrucciones Específicas

Instrucciones para la primera administración (Pretest)

Cuando todos los estudiantes estén sentados y listos para trabajar con sus lapices y gomas de borrar, el examinador puede dar la introducción a la prueba. Siempre refiérase a los problemas de la prueba como juegos o rompecabezas, y explique a los estudiantes que otro día les enseñará estrategias, las cuales les ayudarán a jugar mejor el juego otro día. La siguiente introducción es un ejemplo de como darla. Puede cambiarla para que todos la entiendan.

Hoy van a hacer rompecabezas en el libro de Juegos de Series (muestre el libro pretest). Van a hacerlos por su cuenta y mañana les enseñaré algunas estrategias para resolver los rompecabezas. Después de enseñarles las estrategias tendrán otra oportunidad de hacer estos rompecabezas usando las estrategias.

Dé una libreta a cada estudiante y dígale que escriban sus nombres y apellidos en el espacio correspondiente. Pase por los estudiantes para inspeccionar que todos esté llenándolos correctamente. Cuando terminen con ésto dígales:

-"Pasen a la primera página y miren la primera fila. ¿Qué ven? Hay una serie de figuras y un espacio vacío. Ustedes tienen que escoger la figura que debe estar o que sirve par llenar el espacio vacío. Esa figura es una de las figuras en este lado de la página (a la derecha). Entonces ésta fila a la izquierda, tiene el rompocabezas (muéstrelo) y éstas son las respuestas (muéstrelas). Una sóla de éstas figuras es correcta para el espacio vacío, Uds. tienen que escoger la mejor respuesta. Miren las figuras en el rompecabezas y pregúntense, - ¿Qué debe aparecer próximo? ó ¿Cuál es la figura que sigue? ¿Qué debe estar en el espacio vacío? En seguida miren a las respuestas y marquen con un círculo la contestación que Uds piensan es correcta. ¿Cuál de las respuestas es la correcta para la primera fila? Es el número 1, 2, 3, ó 4? (Muéstreles cada respuesta) Bien, es la 3. Márquenla con un círculo. (Pase por los estudiantes para ver si están haciéndolo correctamente.) Ahora, ustedes pueden hacer los otros de la misma manera. Miren el rompecabezas con el espacio vacío, pregúntense que debe estar allí. Luego escojan la contestación y márquenla con un círculo. Recuerden, solamente hay una contestación correcta. Hagan todos los rompecabezas sin "saltarse" ninguno.

La prueba dura unos 30 minutos o hasta cuando todos terminan, excepto uno o dos. Durante la administración de la prueba pase por los estudiantes para asegurarse que todos están marcando una sola contestación; que no estén marcando retratos en la parte del rompecabezas; y que no estén marcando el retrato que aparece en la misma posición. Puede repetir las instrucciones y darles un poco de refuerzo (decirles que estan haciendo muy bien), pero no darles más información que las que están en las instrucciones.

Instrucciones para el Adiestramiento

La sesión de adiestramiento se presenta al grupo entero que tomó la primera prueba (pretest) y enseña los estudiantes "estrategias" para resolver los problemas de los retratos en series. Trabajando juntos, el grupo aprenderá cómo enfocar y resolver diecisiete (17) problemas.

De énfasis a las siguientes reglas:

1. En cada serie de retratos "algo cambia", y uno tiene que identificar que característica cambia (por ejemplo, cambia el objeto, el tamaño, el color, etc.)

2. Los cambios en cada serie de retratos tienen su propio "ritmo" ó "melodia" ó canción". Uno tiene que descubrir el ritmo o melodia, y cantarselo a sí mismo. Usando el ritmo de

la serie, uno puede continuar con los retratos fuera de la serie. (ej.: grande - pequeño; grande - pequeño; grande - ...?...)

3. La mayoría de las series tiene más de un ritmo; uno tiene que identificar los varios "ritmos" y luego cantarlos individualmente. Cada "ritmo" identifica el cambio en solo una propiedad de los retratos.

4. Para cada "ritmo" que uno canta, uno puede eliminar las respuestas que son incorrectas para ese "ritmo". Las respuestas que quedan le ayuda a uno a decidir el próximo "ritmo" a cantar.

5. Los "ritmos" no tienen que comenzar necesariamente al principio de la serie y pueden ser cantados en cualquier dirección.

Resumiendo: el examinador - usando la idea de ritmo - da adiestramiento al sujeto o estudiante para identificar las propiedades (color, tamaño, objet , etc.) que cambian en la serie, para aislar las propiedades con los ritmos y para eliminar las respuestas incorrectas en cada paso. De énfasis a observar lo que cambia, y decir o cantar el ritmo apropiado para cada propiedad que cambia.

La sesión de adiestramiento debe ser una experiencia de grupo que incluya a todos los miembros de una clase. Instrucciones completas para el adiestramiento siguen a continuación (nota: Si el grupo se aburre puede pasár por encima de algunos ejemplos. Pero tiene que terminar el adiestramiento con el último ejemplo porque ese les enseña a los niños como empezar un ritmo comenzando al final de una serie en vez de hacerlo al comienzo de la serie, es decir "de atrás para adelante".)

Instrucciones para el Adiestramiento

En el libro de ayer trabajamos con filas de retratos los cuales tenían un espacio vacío en cada fila. Uds. tuvieron que escoger el retrato que va en el espacio vacío y completar la serie, y luego marcarlo con un círculo. Ahora vamos a trabajar un poco en éste libro, y yo les enseñaré "estrategias" para que Uds. puedan escoger las respuestas para las series de retratos más fácilmente. Si usan éstas estrategias, los problemas serán muy fáciles. Miren la primera fila en el libro que dice "Tricks for the Series Game". ¿Qué se ven? (Pida que todo el grupo responda; a veces puede preguntar a algunos estudiantes en particular. Todos tienen que trabajar juntos y no deben adelantarse al maestro.) Bien, esa es correcta, es una fila de flores. Miren otra vez a la misma fila y vamos a decir juntos lo que cada retrato es (muestre cada retrato diciendo lo que es) flor, flor, flor, flor, flor, flor. Podemos decir que el "ritmo" ó la "canción" es flor, flor, flor, flor, flor, flor. (Ahora repita la primera serie otra vez repitiendo en voz alta el ritmo y cuando llegue al espacio vacío pregúnteles que debe estar allí.) Vamos a repetir juntos el ritmo de la primera fila (ésta vez siga el ritmo mas allá del espacio vacío). Entonces podemos ver que "flor" sirve para llenar el espacio vacío. Ahora, miren las respuestas que están a la derecha. Sabemos que no puede ser la número 2 porque ésa es una manzana.

Eliminen esa con una raya. (Asegurese que todos están eliminando la respuesta incorrecta, pase por los estudiantes.) ¿Es la número 1? No. ¿Por qué? Bien, porque es pequeña. Eliminen la número 1. ¿Qué queda? La flor negra grande y la pequeña, blanca. ¿Cuál es la contestación correcta? Bien, la número 3 es correcta. Márquenla con un círculo.

Ahora, miren la fila número 2. ¿Qué ven? Sí, hay ositos y relojes, dos clases distintas de retratos. Vamos a mirar la fila y a decir o cantar el "ritmo". Osito, reloj; osito, reloj; osito, reloj (Nota a la maestra: ¿Se dá cuenta usted del ritmo? La "melodia" debe ser leída marcando bien el ritmo para despertar el interés del grupo.) Otra vez: osito, reloj; osito, reloj; osito, ... ¿Qué debe estar aquí? Bien, reloj. Ahora miren las respuestas. Sabemos que la contestación correcta es un reloj. ¿Cuáles son incorrestas? Sí, podemos decir que 1 y 3 no son correctas porque ambos son ositos, entonces elimínenlos. ¿Qué queda? Un reloj pequeño y uno grande. ¿Es el número 2? No. ¿Por qué? Porque es muy pequeño. Eliminen 2. ¿Ahora, qué queda? El reloj grande, número 4. Esta es la contestación correcta. Entonces márquenla con un círculo. (Asegurase que todos los estudiantes cogen el ritmo. Puede mover las manos al compás del ritmo mientras presenta la serie. La maestra debe preguntar al grupo y también preguntar individualmente a los que no están poniendo atención. El adiestramiento debe ser excitante, pero no debe ir tan rápido que los estudiantes que aprenden despacio se pierdan.)

En los problemas siguientes les enseñaré que hay diferentes tipos de ritmos que Uds tienen que buscar en las filas. Acabamos de ver que los retratos pueden cambiar de ositos a relojes. En la tercera fila vemos un cambio diferente. ¿Quién puede decirme qué cambia aquí? Bien, el color cambia del negro al blanco. ¿Cambia el retrato? No. Todos los retratos son de aves, entonces no vamos a dar atención a los retratos pero al "ritmo" del color. Recuerden, no vamos a decir ave cada vez, solamente vamos a decir el color. (Asegúrese que todos están diciendo solamente el color para evitar condusiones más tarde cuando más de un ritmo sean presentados.)

Vamos a decir el ritmo del color. Blanco, negro; blanco, negro; blanco, negro. (El examinador siempre debe continuar con el ritmo más allá del espacio vacío.) Otra vez. Blanco, negro; blanco, negro; blanco,...... ¿Qué viene después? Bien, negro. Negro es al contestación correcta. Entonces cuáles de las respuestas podemos eliminar? Números 2 y 3 porque son blancos. ¿Qué queda? El ave negra, grande y la negra y pequeña.* Entonces elimina en la número 4 y marquen la número 1 con un círculo.

Pasen a la próxima página. Miren la fila 4. ¿Qué ven? Hay uan fila de pelotas, entonces sabemos que los retratos no cambian. ¿Qué cambia? Bien, el tamaño de los objetos. Hay pelotas grandes y pequeñas. ¿Cambia el color? No. Vamos a leer la fila y decir el ritmo del tamaño. Recuerden, no

*¿Cuál es la respuesta correcta? La número 1 es la correcta porque todas las aves son grandes.

tenemos que decir pelota porque están interesados solamente en el tamaño. Grande, pequeño; grande, pequeño; grande, pequeño. (Nota: Siempre sigue el tono más allá que del espacio vacío.) Otra vez. Grande, pequeño; grande, pequeño; grande,.....¿Qué viene ahora? Pequeño. Miren las respuestas. Sabemos que la contestación tiene que ser pequeño. Entonces ¿Cuáles podemos eliminar? Bien, podemos eliminar 2 y 3 porque ambas son grandes. ¿Qué queda? La pelóta negra,grande y la pelota pequeña, blanca. ¿Cuál es la contestación correcta? Bien. La pequeña pelota blanca porque todas las pelotas son blancas, entonces eliminen número 1 y marquen el 4 con un círculo.

¿Qué ven en la fila 5? Sí, son retratos de una flor, un perro, y un hombre. Hemos visto prolemas con un solo tipo de retratos y problemas con dos tipos de retratos. Ahora, encuentran tres tipos de retratos en esta fila. ¿Cambia el color en ésta? No. ¿Cambia el tamaño? No. Otra cosa es diferente. ¿Quién puede decirme lo que es? Bien. El espacio vacío aparece en el medio de la fila en vez de estar al final. Esto hace al problema un poco más difícil, pero usamos la misma estrategia. Vamos a leer el ritmo juntos, - flor, perro, hombre; flor, perro, hombre; flor, perro, hombre. Otra vez. Flor, perro, hombre; flor, perro, hombre,...¿Qué viene después? Correcta - una flor. Miren las respuestas. Sabemos que una flor es la contestación correcta. ¿Entonces cuáles podemos eliminar? Sí, podemos eliminar todas excepto la flor, número 3, pués es la contestación correcta. Marquen la flor con un círculo. Vamos a hacer un repaso. ¿Qué son las cosas que hemos encontrado (en los 5 problemas) que pueden cambiar? Bien, Color, Tamaño y Forma.

Eso significa que podemos tener tres ritmos distintos.

Miren la fila 6. ¿Qué cambia? Tamaño. ¿Hay otros cambios? No. Vamos a leer el ritmo del tamaño. Grande, pequeño, pequeño; grande, pequeño, pequeño; grande, pequeño, pequeño. (Aún cuando la serie escrita no esté completa, la maestra siempre debe leer un ritmo completo.) Otra vez. Grande, pequeño, pequeño; grande, pequeño,.... ¿Qué viene ahora? Bien, pequeño. Miren las respuestas. ¿Qué podemos eliminar? Podemos eliminar los números 2 y 3 porque ambos son grandes. ¿Cuál es la correcta? Número 1. ¿Por qué no es la 4? Porque la dirección es incorrecta. Marquen el 1 con un círculo.

¿Qué cambia en la fila 7? Bien - los retratos cambian. ¿Cambian el color? No. ¿El tamaño? No. ¿Dónde esta el espacio vacío en ésta fila? Correcto, el espacio vacío aparece al principio de la fila. Cuando se encuentren con el espacio vacío al principio usen ésta estrategia: Comenzamos a leer el tono desde el fin de la fila en vez del principio. Vamos a leer el tono juntos comenzando al final de la fila. Dama, dama, ave, pelota; dama, dama, ave, pelota. Otra vez. Dama, dama, ave, pelota; dama, dama, ave,....¿Qué viene ahora? Bien, pelota. Pelota es la contestación correcta. Miren las respuestas. ¿Cuáles podemos eliminar? Podemos eliminar los numeros 1 y 4 porque son aves y el 3 porque es una dama. ¿Qué queda? Sí, marquen el 2 con un círculo. Esa es la contestación correcta. - pelota.

Vamos a la fila 8 y veamos que cambia en ésta. ¿Quién puede decirme qué cambia? Sí, la posición cambia. Algunas manos están para arriba y otras para abajo. ¿Hay otros cambios? No. Entonces vamos a leer el ritmo de posición para esta fila diciendo solamente "arriba" ó "abajo" para cada retrato. O.K. La primera va arriba entonces decimos, arriba, abajo; arriba, abajo; arriba, abajo. Decimos la serie otra vez. Arriba, abajo; arriba, abajo; arriba.... ¿Qué debe estar en el espacio vacío? Bien, necesitamos una "arriba". Miren las respuestas. ¿Cuáles podemos eliminar? Bien, eliminen la 2 y 3 porque van hacia abajo. ¿Ahora, cuál es la contestación correcta? Sí, 1 es la contestación correcta. Eliminen la número 4 y marquen la 1 con un círculo. ¿Por qué es 4 incorrecta? Bien, va en la dirección incorrecta.

Ahora, vemos que varias cosas pueden cambiar en cada fila: tamaño, figura, color, y posición. (En las filas siguientes, las cuales tienen más de un ritmo, la maestra debe decirles que prefiere que los estudiantes empiecen con el ritmo de color, después tamaño, posición y terminan con retrato. En esta manera aprenderán a buscar todos los ritmos (uno a uno) en vez de parar después de leer lo más obvio - el ritmo de la figura.) En la fila 9 vamos a ver que a veces más de una cosa cambia en la fila y tenemos que usar más de un ritmo, por ejemplo, las cosas pueden ser negro y blanco y también grande y pequeño. Tendremos que ver cada cambio individualmente (de separado) y de ésta manera será mas fácil escoger la contestación correcta. Ahora, cuando miremos una serie buscaremos qué tipos de cambios hay y miraremos cada uno individualmente. Miren la fila 9.

¿Qué tipos de cambios se ven? Bien. Los retratos cambian. Hay ositos y perros. ¿Qué más cambia? Sí, el color cambia de negro a blanco. ¿Algo más cambia? No, miremos el cambio del color primero. ¿quién puede leer el ritmo para el color? Blanco, negre; blanco, negro; blanco, negro; blanco, negro. Otra vez. Blanco, negro; blanco, negro. ¿Qué viene? Bien, blanco. Ahora, miren las respuestas. ¿Cuáles podemos eliminar? Sí, podemos eliminar los números 2 y 4 porque son negros. ¿Qué queda? Un perro y un osito. Lean la fila otra vez usando el ritmo de retrato para que podemos escoger la contestación correcta. Osito, osito, perro, perro; osito, osito, perro, perro. Otra vez, osito, osito, perro, perro. ¿Qué viene? Bien, osito. Miren las respuestas Podemos eliminar el perro y la contestación correcta es osito. Márquenlo con un círculo.

Miren la linea 10. ¿Qué tipos de cambios se ven? Bien - el retrato cambia de llave a avión. ¿Qué más cambia? Tamaño. ¿Algo más? No, vamos a decir el ritmo de tamaño primero. Grande, grande, pequeño, pequeño; grande, grande, pequeño, pequeño. Otra vez. Grande, grande, pequeño, pequeño; grande, grande, pequeño. ¿Qué viene ahora? Bien, pequeño. Ahora, miren las respuestas. ¿Qué podemos eliminar? Sí, podemos eliminar los números 1 y 4 porque son grandes y queremos un pequeño para el espacio vacío. ¿Qué queda? Una llave y un avión. Vamos otra vez a la fila y leamos el ritmo para retratos para decidir cuál es correcto - la llave ó el avión. Llave, avión; llave, avión; llave, avión; llave, avión. Otra vez. LLave, avión; llave, avión; llave, avión; llave,....¿Qué viene? Bien, un avión. Podemos eliminar la llave y marcar el 3 -

avión - con un círculo.

Miren la fila 11. ¿Qué ven? Manzanas. ¿Cambia el retrato? No. Entonces ¿Qué cambia? Tamaño. ¿Qué más? Color. OK, vamos a mirar la fila 11 y leer el ritmo del color. Blanco, blanco, negro; blanco, blanco, negro; blanco, blanco, negro. Vamos a leerlo otra vez. Blanco, blanco, negro; blanco, blanco, negro; blanco,.... ¿Qué viene? Bien, blanco. Ahora miren las respuestas. Sabemos que la contestación correcta es blanca. ¿Entonces cuáles podemos eliminar? Bien, podemos eliminar los números 1 y 2 porque son negros. ¿Qué queda? Una manzana grande y una pequeña. Vamos a leer la serie otra vez para que podamos escoger la contestación correcta. Esta vez vamos a leer el ritmo para tamaño. Grande, grande, grande; pequeño, pequeño, pequeño; grande, grande, grande. Otra vez: grande, grande, grande; pequeño, pequeño, pequeño; grande,... ¿Qué viene ahora? Bien, grande es correcto. Entonces podemos eliminar la manzana pequeña y marcar la grande con un círculo - pues es la contestación correcta.

Vamos a la 12. ¿Qué cambia aquí? Bien, el retrato cambia de gato a niño. ¿Qué más cambia? Sí, tamaño. ¿Cambia el color? No, todos son blancos. ¿Cambia la posición? No, entonces empezamos con el ritmo para tamaño. ¿Quién puede decir el ritmo para tamaño? (La maestra tiene que chequear constantemente la participación de los estudiantes y pedir la cooperación de los que son inactivos. Nadie debe estar perdido en este punto.) Grande, grande, grande; pequeño, pequeño, pequeño; grande, grande, grande. Otra vez. Grande, grande, grande; pequeño, pequeño, pequeño; grande, grande. ¿Qué viene? Bien - grande.

Miren las respuestas. ¿Cuáles podemos eliminar? Correcto - podemos eliminar los números 2 y 4 por que son pequeños y necesitamos un grande. ¿Qué queda? Un gato y un niño. Vamos a la fila y leamos el ritmo para retratos para saber la contestación correcta. Gato, niño; gato, niño; gato, niño; gato, niño; gato. Otra vez. Gato, niño; gato, niño; gato, niño; gato, niño. ¿Qué viene? Bien - un gato. Sabemos que el número 1, gato grande, es la contestación correcta. Márquenlo con un círculo.

Miren la fila 13. ¿Qué cambia? Correcto. El retrato cambia. Hay gatos y aves. ¿Qué más cambia? El color. Son blancos y negros. ¿Qué más? El tamaño cambia. ¿Algo más cambia? No, entonces en esta fila tenemos que usar tres ritmos distintos. Vamos a la serie usando el ritmo de tamaño primero. Grande, grande, pequeño; grande, grande, pequeño; grande, grande, pequeño; grande, grande, pequeño. ¿Qué viene? Bien, grande. Miren las respuestas. ¿Cuáles podemos eliminar? Sí, podemos eliminar los números 2 y 5 porque son pequeños. Vamos de nuevo a la fila, esta vez leyendo el ritmo para color. Blanco, negro; blanco, blanco, negro; blanco, blanco, negro; blanco, blanco, negro. Otra vez. Blanco, negro; blanco, blanco, negro; blanco, blanco, negro; blanco.... ¿Qué viene? Bien, blanco. Ahora, miren las respuestas y ¿Cuáles podemos eliminar? Sí, podemos eliminar los números 3 y 4 porque son negros. ¿Qué queda? Un gato y un ave. Entonces vamos a leer el tono para retratos para saber la contestación correcta. Ave, ave, ave; gato, gato, gato; ave, ave, ave; gato. Otra vez. Ave, ave, ave; gato, gato, gato; ave, ave, ave... ¿Qué viene? Correcto es gato. Entonces podemos eliminar el ave y marcar la contestación correcta con un círculo, el gato, número 1.

Miren la fila 14. ¿Cuándo el espacio vacío esta el principio, qué estrategia usamos? Bien, empezamos por el otro lado. ¿Cuáles son los cambios en esta fila? Tamaño, Color, Retratos. Bién, vamos a empezar con el ritmo de color. Recuerden, vamos a leer cada ritmo por separado. Negro, negro; blanco, blanco; negro, negro; blanco, blanco. Otra vez, negro, negro; blanco, blanco; negro, negro; blanco. ¿Qué viene? Blando. Miren las respuestas. ¿Cuáles podemos eliminar? Números 1, 3, y 6 porque son negros y necesitamos un blanco. Vamos a leer el ritmo para tamaño. Pequeño, pequeño, grande; pequeño, pequeño, grande; pequeño, pequeño, grande. Otra vez. Pequeño, pequeño, grande; pequeño, pequeño, grande; pequeño. ¿Qué viene? Bien, pequeño. Otra vez, miren las respuestas y podemos eliminar el 2 porque queremos un pequenño y el 2 es grande. Finalmente vamos a leer el ritmo del retrato. Pelota, flor; pelota, flor; pelota, flor; pelota, flor. Otra vez. Pelota, flor; pelota, flor; pelota, flor; pelota. ¿Qué viene? Flor. ¿Qué respuestas quedan? Una pelota y una flor. ¿Cuál es la contestación correcta? La flor blanca, pequeña, el número 3 es la contestación correcta. Entonces podemos eliminar la pelota blanca, pequeña y poner un círculo alrededor del 3.

Miren la fila 15. ¿Qué cambia aquí? Los retratos cambian. Hay libros, carros, pescados, y perros. ¿Qué más cambia? Tamaño. ¿Qué más? Nada más. Vamos a leer el ritmo para tamaño. Grande, pequeño, pequeño; grande, grande, pequeño, pequeño; grande, grande. Otra vez. Grande, pequeño, pequeño;

grande, grande, pequeño, pequeño. ¿Qué viene? Grande es correcto. Miren las respuestas y dígame qué podemos eliminar. Sí, podemos eliminar todos los pequeños, números 4 y 5, porque necesitamos un grande para el espacio vacío. ¿Qué queda? Un pescado, un perro y un libro. Ahora, tenemos que leer el ritmo para retratos. Libros, libro; carro, carro; pescado, pescado; perro, perro. Otra vez. Libro, libro; carro, carro; pescado, pescado; perro. ¿Qué viene? Bien, perro. Ahora, sabemos que la contestación correcta es perro. Entonces podemos eliminar el pescado y el libro y marcar el 3 con un círculo - el perro blanco, grande.

Pasen a la última página y miren la fila 16. ¿Qué cambia aquí? Retratos. Color. Tamaño. Bien, entonces sabemos que tenemos que usar tres ritmos distintos. Empecemos con el ritmo de tamaño. Grande, pequeño; grande, pequeño; grande, pequeño; grande, pequeño; grande, pequeño. Otra vez. Grande, pequeño; grande, pequeño; grande, pequeño. ¿Qué viene? Grande. Miren las respuestas. ¿Cuáles podemos eliminar? Números 3 y 5 porque son pequeños y queremos un grande. Vamos a la fila y leamos el ritmo de color. Blanco, blanco, negro, negro; blanco, blanco negro, negro; blanco, blanco, negro, negro; blanco, blanco. Otra vez. Blanco, blanco, negro, negro; blanco, blanco. ¿Qué viene? Negro. ¿Ahora, cuáles podemos eliminar? La 2 porque es blanco. ¿Qué queda? Manzana, flor y oso. Ahora tenemos que leer el ritmo de los retratos para decidir cuál es correcto. Oso, manzana, flor; oso, manzana, flor; oso, manzana, flor; oso, manzana, flor. Otra vez. Oso, manzana, flor; oso, manzana, flor. ¿Qué viene? Oso es correcto. Podemos eliminar la manzana y la flor y marcar el 6 con un círculo, la contestación correcta - el oso negro grande.

Miren la última fila - número 17. ¿Qué cambia en esta fila? Los retratos. ¿Algo más? Correcto, solamente los retratos cambian. Vemos que los retratos son de niñas, casas, y gatos. Hay tres tipos de retratos. Vamos a ver como es el ritmo. (Este ejemplo es bueno para que un niño lo haga solo, especialmente si hay alguno que piensa que entiende bien las estrategias y esta a punto de acabar con la paciencia de la maestra. Si el niño empieza mal, dígale que empiece en el otro lado y que el ritmo tiene tres figuras distaintas. Cuando termine diciéndolo correctamente, repítalo con el grupo entero.) Niña, casa, niña, gato; niña, casa, niña, gato; niña, casa, niña, gato. Vamos a decirlos otra vez. Niña, casa, niña, gato; niña, casa, niña, gato; niña, casa, niña. ¿Qué retrato falta en ésta serie? Gato es correcto. Ahora, si miramos las respuestas abajo, vemos que los números 2, 3, 5, y 6 son incorrectos porque no son gatos y queremos un gato. ¿Cuál es correcto? Bien - número 1, el gato grande es la contestación correcta. Es del mismo tamaño que el otro gato en la fila. Ahora han visto que una fila tiene más de un ritmo, y si usamos las estrategias, los problemas son muy fáciles de resolver. Cuando muchas cosas cambian, como color, tamaño, y el retrato o la posición, sabemos que tenemos que ver cada cambio por separado y eliminamos las contestaciones incorrectas para cada ritmo. Después de leer todos los ritmos en la fila, podemos marcar la contestación correcta con un círculo.

Instrucciones para la Segunda Administración (Posttest)

La segunda administración debe ser presentada por la misma maestra dentro de tres días pero no más de una semana después de la primera sesion. Ésta sesión también dura unos 30 minutos o hasta que todos, excepto uno o dos estudiantes, hayan terminado. Antes de comenzar a trabajar, el examinador deles un breve repaso de las estrategiaas que han aprendido en la sesión anterior, estimulándoles a usar las estrategias y expresando confianza en la habilidad de los niños que ahora es mayor. No de la prueba a los niños que estuvieron ausentes en la primera sesión.

Todos tienen que llenar la primera página como lo hicieron en la primera sesión y abran el cuaderno en la página 1. Este cuaderno (muestre le cuaderno "posttest") es igual al otro que Uds. hicieron antes. Recuerden que tienen que escoger el retrato que debe estar en el espacio vacío y marquen la contestación correcta con un círculo. Esta vez, deben usar todas las estrategias que han aprendido. Busquen todas las cosas que cambian en cada fila: color, tamaño, ó retrato. Siempre dejen el cambio en figura (ó retrato) para el final. Después digan el ritmo para cada cambio individualmente y eliminen las contestaciones incorrectas. No se olviden la estrategia de comenzar al otro lado cuando el espacio vacío aparece al principio de la fila. Marquen una sola contestación y no pasen por encima de una fila.

Calificación

El puntaje es el total de los problemas contesados correctos. Use la clave para corregir la prueba. Dé crédito solamente cuando una respuesta fué marcada con un círculo. A veces un niño marca el retrato en la serie. Si ésta es el único retrato marcado y es la contestación correcta dele crédito.

Ponga el puntaje en la primera página de los cuadernos "posttest". Márquenlos de la siguiente manera:

APPENDIX D

Picture Motivator Scale, English

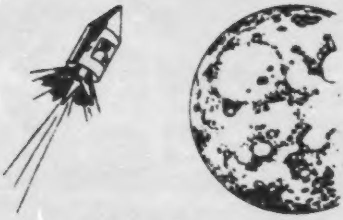
Picture Motivator Scale, Spanish

ID # ____________

NAME ______________________ DATE ____________

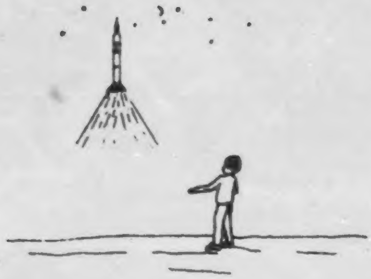
SCHOOL ______________ TOWN ____________ GRADE ________

THE PICTURE MOTIVATION SCALE

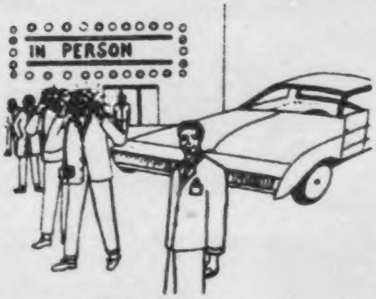


Do something exciting

1

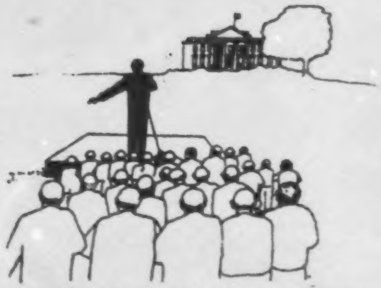


Be sure not to get hurt

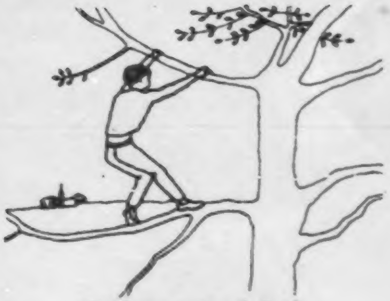


Be famous

2

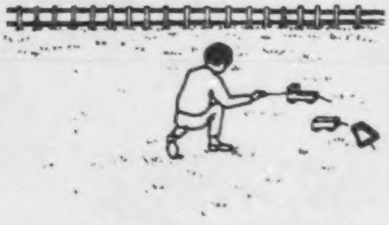


Be the leader of the country.



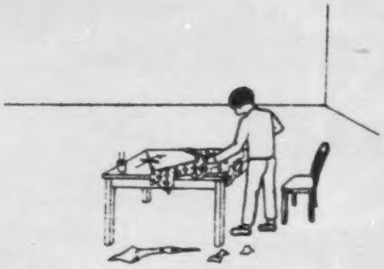
Swing up high
where it is exciting

3

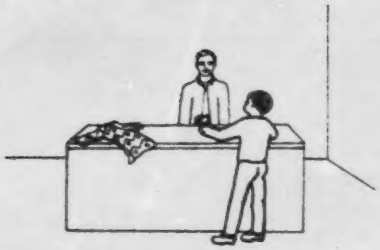


Play where it is safe

4

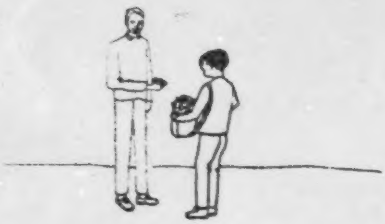


Make a costume by myself

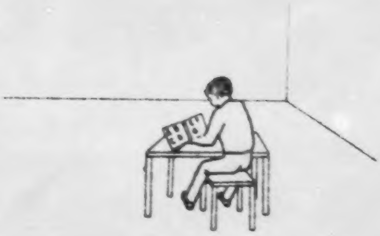


Buy a costume because it is easier

5

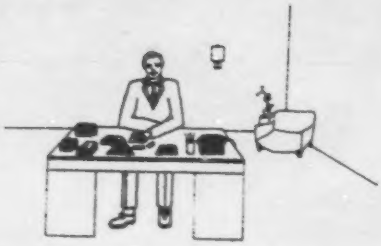


Make some money

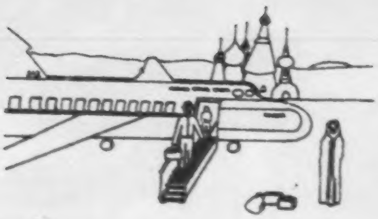


Learn to read better

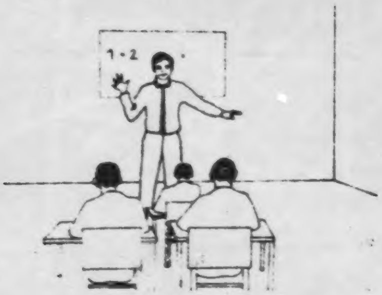
6



Be rich

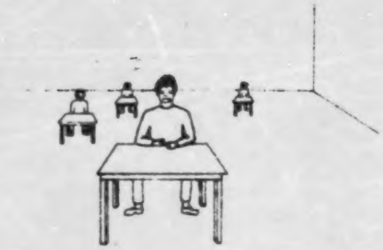


Go to strange and exciting places

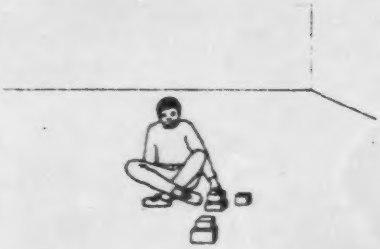


Be in charge

7

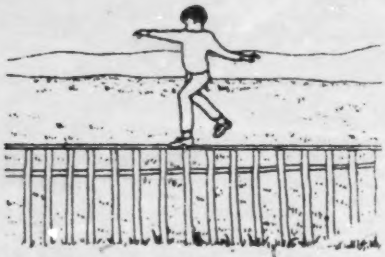


Not have to worry
about everybody

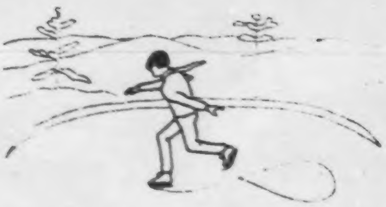


Play an easy game

8

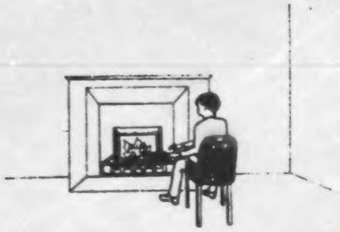


Play a hard game

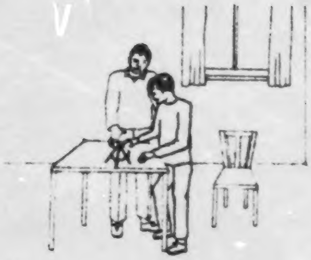


Learn to ice skate

9

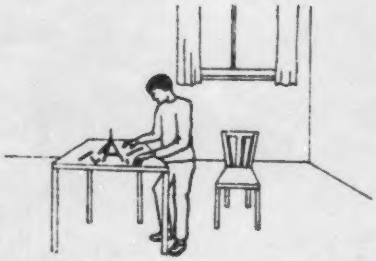


Stay inside where
it's warm

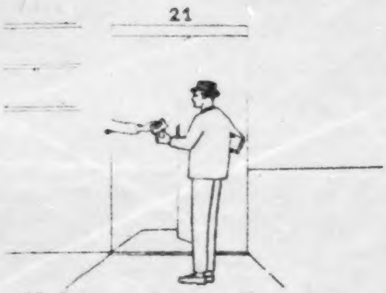


Have someone help me

10

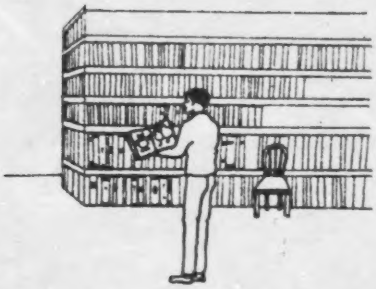


Try to do it myself

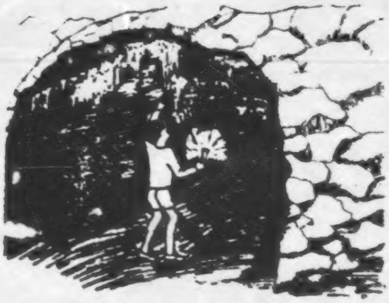


Make a lot of money

11

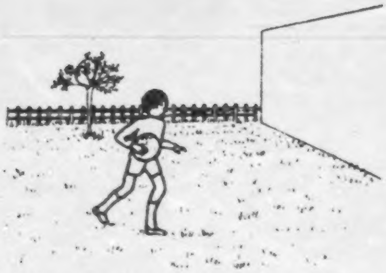


Learn about all
kinds of things

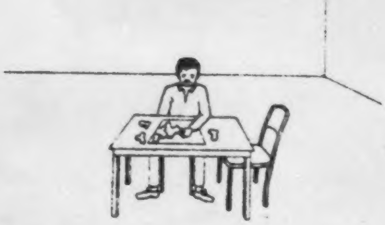


Explore a cave

12

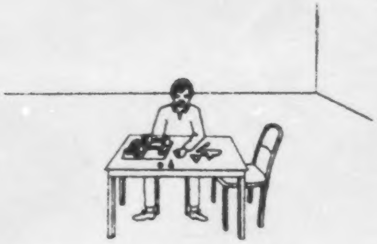


Play where it is safe

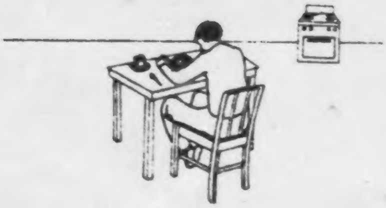


Do something I already know how to do

13

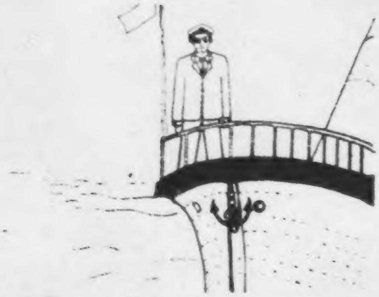


Learn to do something new

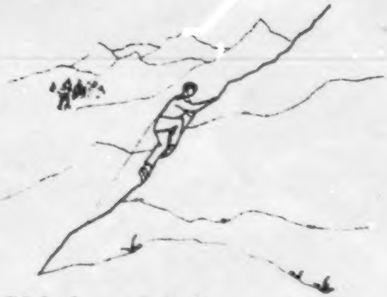


Cook my own meals

14

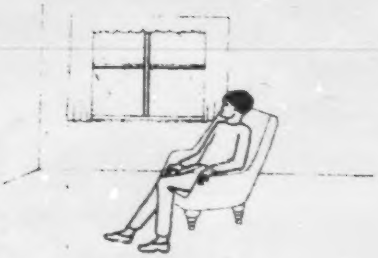


Have all the power

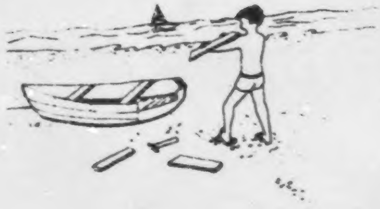


Climb a high mountain

15

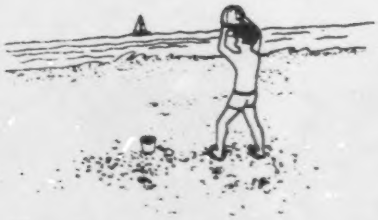


Stay inside where it won't rain on me

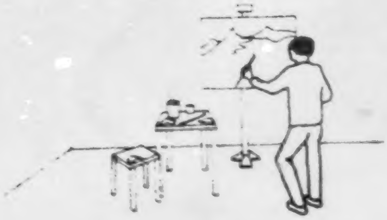


Try to build a boat

16

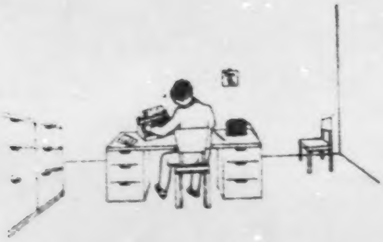


Do something easy

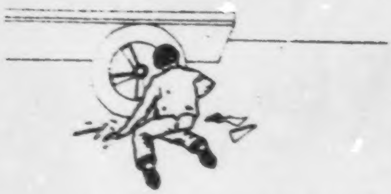


Draw beautiful pictures

17

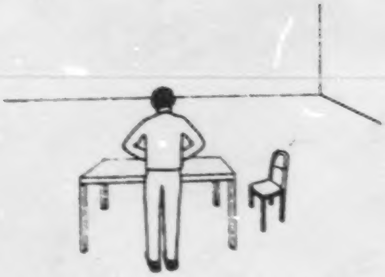


Be paid regularly
every week



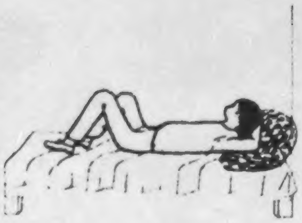
Work on broken machinery

18

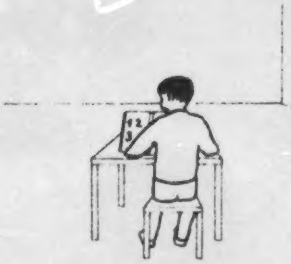


Do something that
won't get me dirty

19

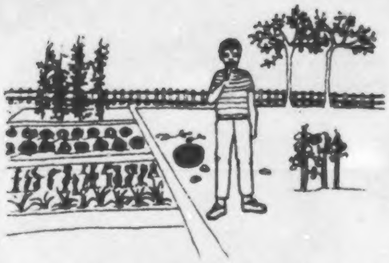


Rest

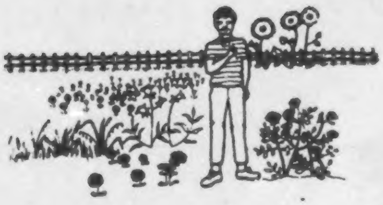


Learn about numbers

20



Garden of vegetables that I could eat



Garden of flowers that would be beautiful

Nombre ______________________ Sexo __________ Fecha ____________

Grado ____________ Escuela ____________ Nacimiento _________ Edad _____

Punteo (IM o' EM)

1. __________
2. __________
3. __________
4. __________
5. __________
6. __________
7. __________
8. __________
9. __________
10. __________
11. __________
12. __________
13. __________
14. __________
15. __________
16. __________
17. __________
18. __________
19. __________
20. __________

Punteo Total:

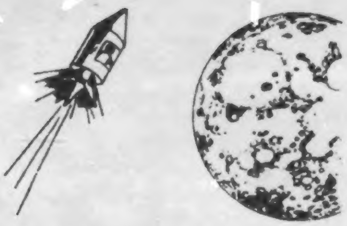
IM __________

EM __________

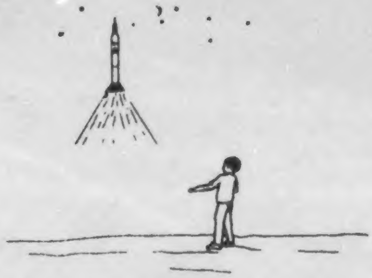
- - - - - - - - - - - - - - - -

D __________

1

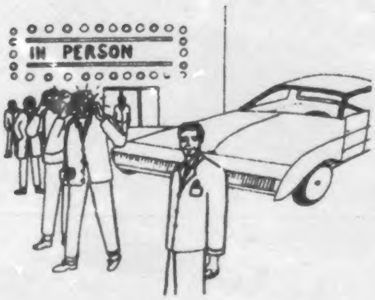


Hacer algo emocionante

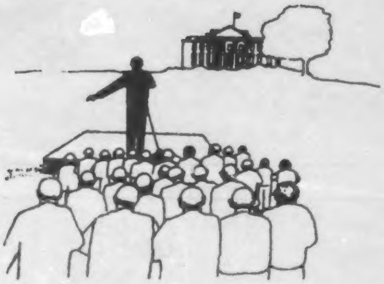


Hacer seguro a evitar peligro

2

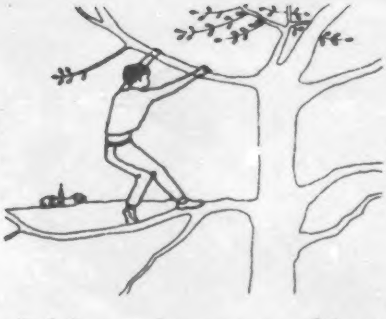


Ser famoso

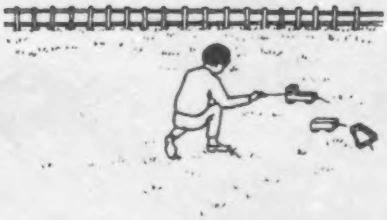


Dile a todo el mundo lo que tiene hacer

3

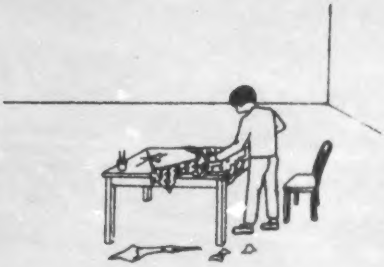


Subir a lugares altos y emocionantes

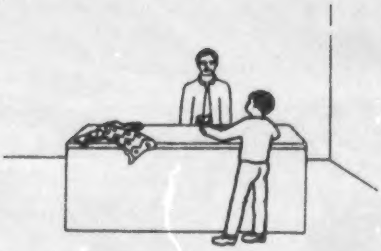


Jugare en lugares seguros

4

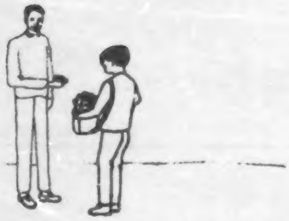


Hacerme mis propios disfraces

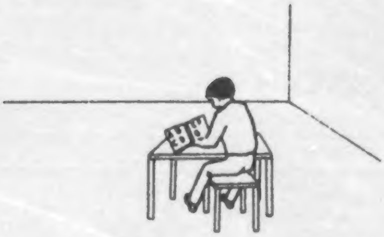


Comprarlos porque es más fácil

5

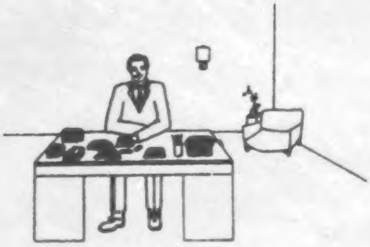


Ganar dinero

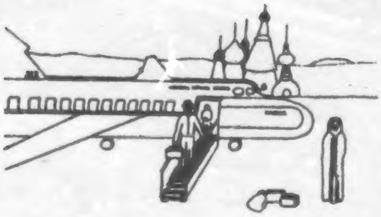


Aprender a leer mejor

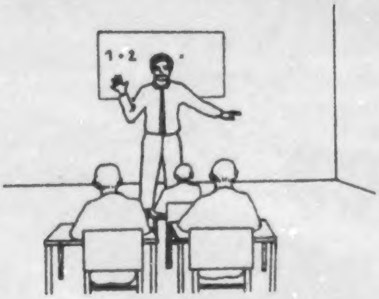
6



Hacerse rico

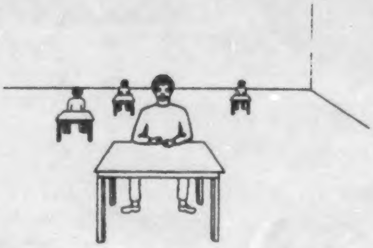


Ir a lugares extraños y lejanos

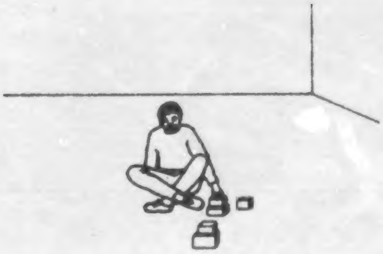


Estar en cargo

7

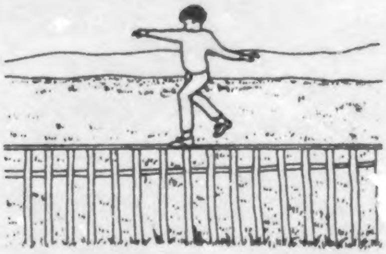


No preocuparse por nadie

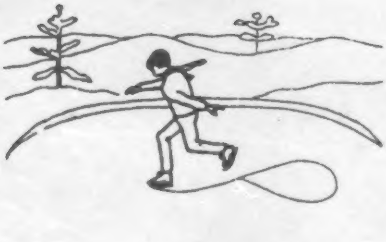


Jugar algo fácil

8

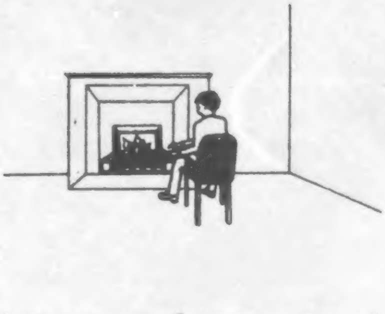


Jugar juegos dificiles



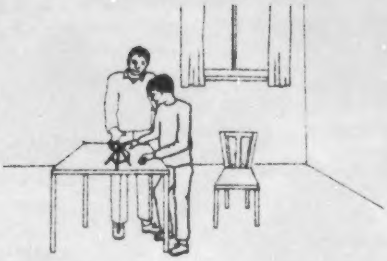
Aprender a patinar en hielo

9

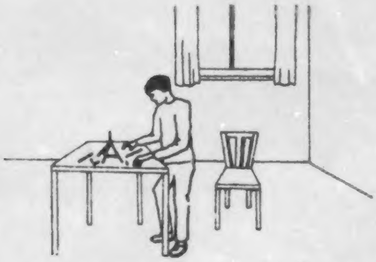


Estar en un lugar commodo

10

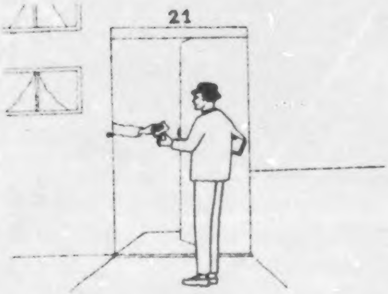


Tener a alguien quien me ayude

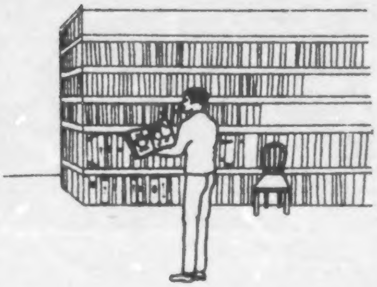


Hacer las cosas yo solo

11

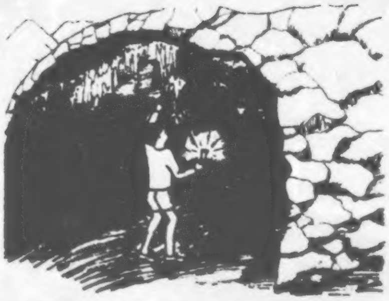


Ganar mucho dinero

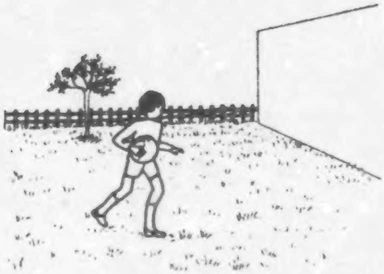


Aprender acerca de muchas cosas

12

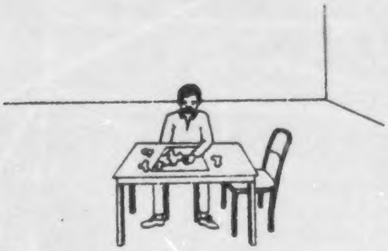


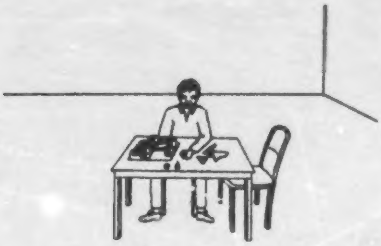
Explorar una cueva



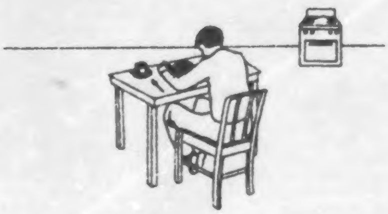
Jugar en un lugar seguro

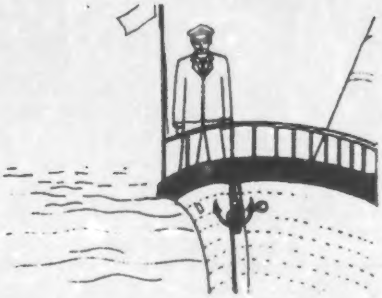
13


Hacer algo que ya
se sabe

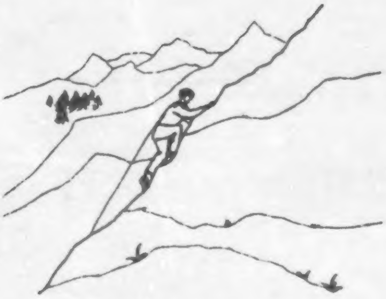

Aprender a hacer algo nuevo

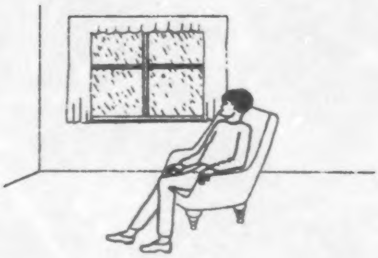
14

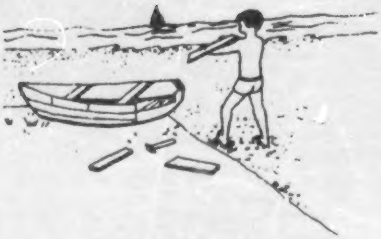

Preparar mis propios comidas


Tener todo el poder

15

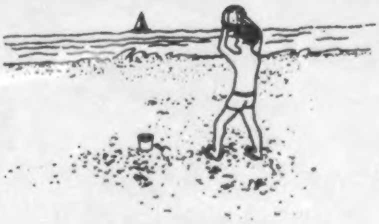

Escalar una montaña alta


Quedarme en casa para no
mojarme con la lluvia

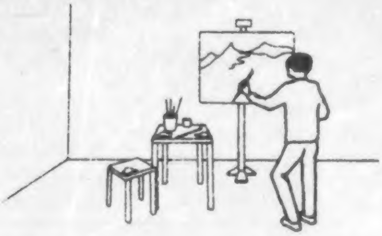


Tratar de hacer una lancha

16

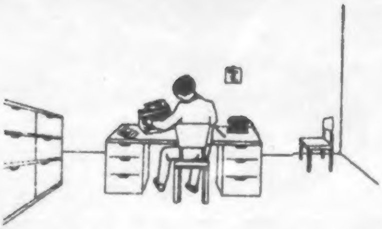


Hacer algo fácil

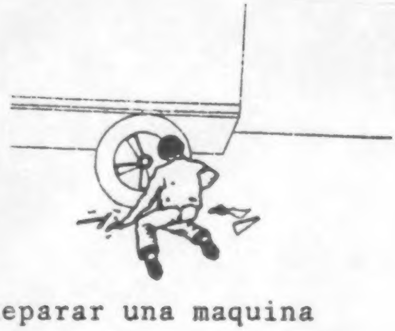


Hacer dibujos bonitos

17

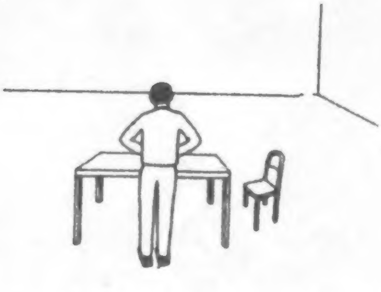


Que me pagan cada semana

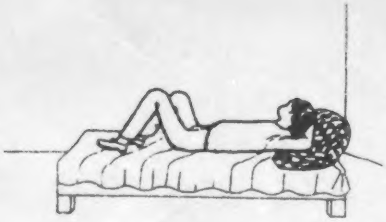


Reparar una maquina

18

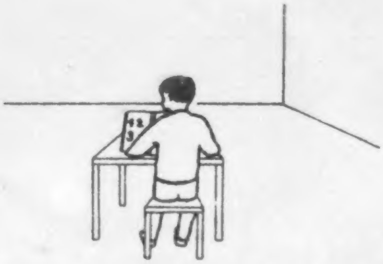


Hacer algo donde no me ensucie

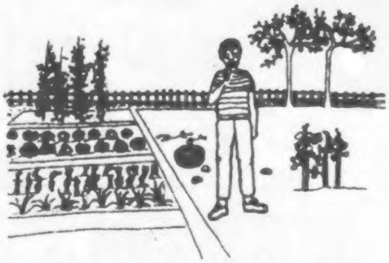


Descansar

19

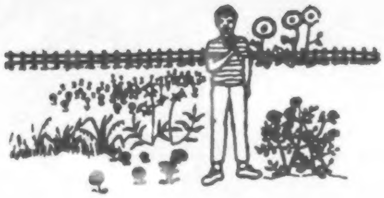


Aprender los numeros



Tener un jardin de legumbres
que yo pueda comer

20



Tener un jardin de flores que
se vea muy bonito